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Summary of Fish Population Data from Sipiwesk and Cross Lakes, 1987

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ABSTRACT

Experimental netting was continued on Sipiwesk and Cross lakes in 1987 under Claim #18 of the Northern Flood Agreement. Fish population data collected from these lakes during the open water season has been summarized and presented in this report in order to make it more easily accessible for future reference.

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INTRODUCTION

Cross and Sipiwesk lakes are located on the Upper Nelson River System. Cross Lake is immediately downstream of Manitoba Hydro's Jenpeg Generating Station while Sipiwesk Lake is just downstream of Cross Lake. Lake Winnipeg Regulation and the operation of Jenpeg Generating Station both have an influence on water level and flow conditions through these two lakes.

In 1985 an Ecological Monitoring Program under the auspices of the Northern Flood Agreement was initiated to investigate and document the possible impact of hydro development on fish populations within the Churchill River Diverison and Nelson River Systems. Cross and Sipiwesk lakes were two of the six lakes chosen for annual sampling.

The purpose of this report is to present the fish population data collected from Cross and Sipiwesk lakes in 1987 in a form that will make it readily and more easily available for future reference.

METHODS

Fish samples were collected with standard gangs of gillnets. These gangs consisted of various mesh sizes as follows: 1.5", 2.0", 3.0", 3.75", 4.25" and 5.0" stretched measure. Each net was 22.9 m (25 yd) long and 1.8 m (6 ft) deep. In Cross Lake an additional panel (5.25 inch mesh size) was added to the standard gangs in order to simulate a previous study by Gaboury and Patalas (1981). Gillnet sets were set on the bottom and overnight for 16 - 20 h duration.

Fork length and round weight measurements were recorded for all fish caught. Sex and state of maturity were recorded and ageing structures were taken from the principal commercial fish species of lake whitefish, cisco, walleye, sauger and northern pike. Ageing structures wer collected as follows: otoliths and first three pectoral fin rays from whitefish and cisco, otoliths and first three dorsal spines from walleye and sauger and the left cleithrum and first three pectoral fin rays from northern pike.

In this study, Cross lake was divided into two separate basins. This was consistent with the study by Gaboury and Patalas (1982) who felt the eastern basis of Cross Lake held a different population of fish to that of the west basin. Consequently, Cross Lake was treated as two lakes (West Cross and East Cross) and two samples of fish were produced.

Summaries and growth curve analysis were performed by the same methods as decribed by Patalas (1984) and Kirton (1985).

RESULTS

Sampling areas and netting locations for the 1987 program are illustrated in Figures 1-9. The same netting locations are attempted from year to year. However, the frequency and sequence of locations vary depending upon fishing success and weather conditions.

Age composition histograms for the principal commercial species are depicted in Figures 10-13 while fork length histograms are shown in Figures 14-28. Fork length histograms were also constructed for non quota species (white sucker, longnose sucker, mooneye, etc.) where fish numbers were adequate.

Growth curves for the prinicpal commercial species are shown in Figures 29-35. The solid line curve represents a power curve regression analysis. All points (open circles and solid circles) were used to determine power curve equations. The broken dash lines represent von Bertallanfy growth curve analysis. Open circles represent age classes that were omitted from the Walford and Brody regression during the calculation of the von Bertallanfy equation and growth curve line.

A breakdown of species and number of fish cuaght within each net set are shown in Tables 1-3. Catch per unit effort (CUE) summaries are given in Table 4. Tables 5-7 gives total weight of each species caught in the different mesh sizes. Tables 8-26 depicts mesh size effects on CUE, mean sizes, maturity and age composition. Age class percent frequencies from the total column are these frequencies used to determine age composition histograms.

A breakdown of numbers of fish for each age in each set and sexes combined are presented in Tables 27–40. These tables also give average lengths and weight for each age. Information from these tables have been used to calculate mortality and survival (Table 44), maturity (Table 45) and growth curve analysis (Tables 46–47, Figs. 29–35).

Length–weight regressions for fish caught from Cross and Sipiwesk lakes are presented in Tables 41–43.

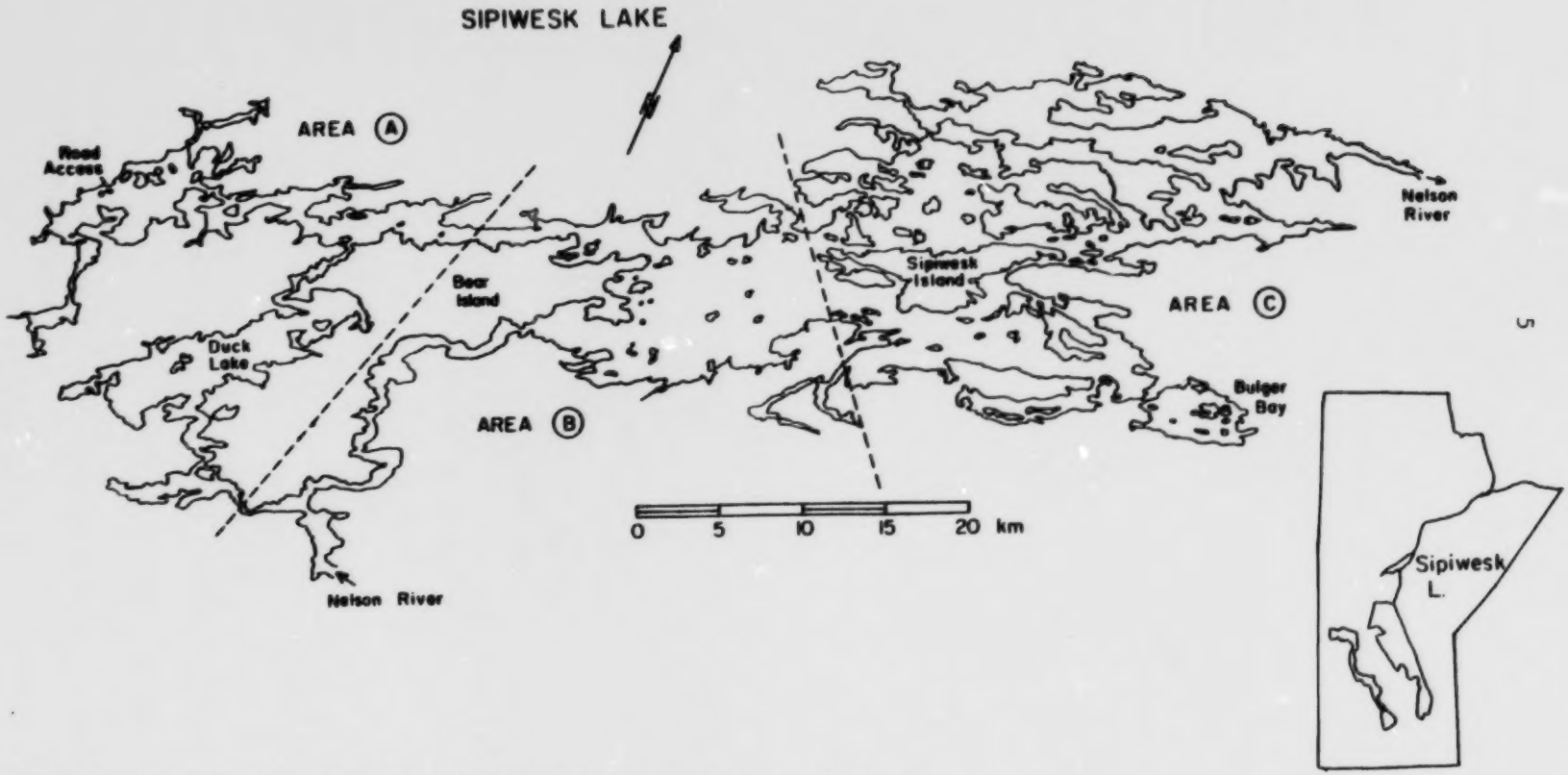

Fig. 1. Map showing location of Sipiwisk Lake and three designated netting areas used in 1987.

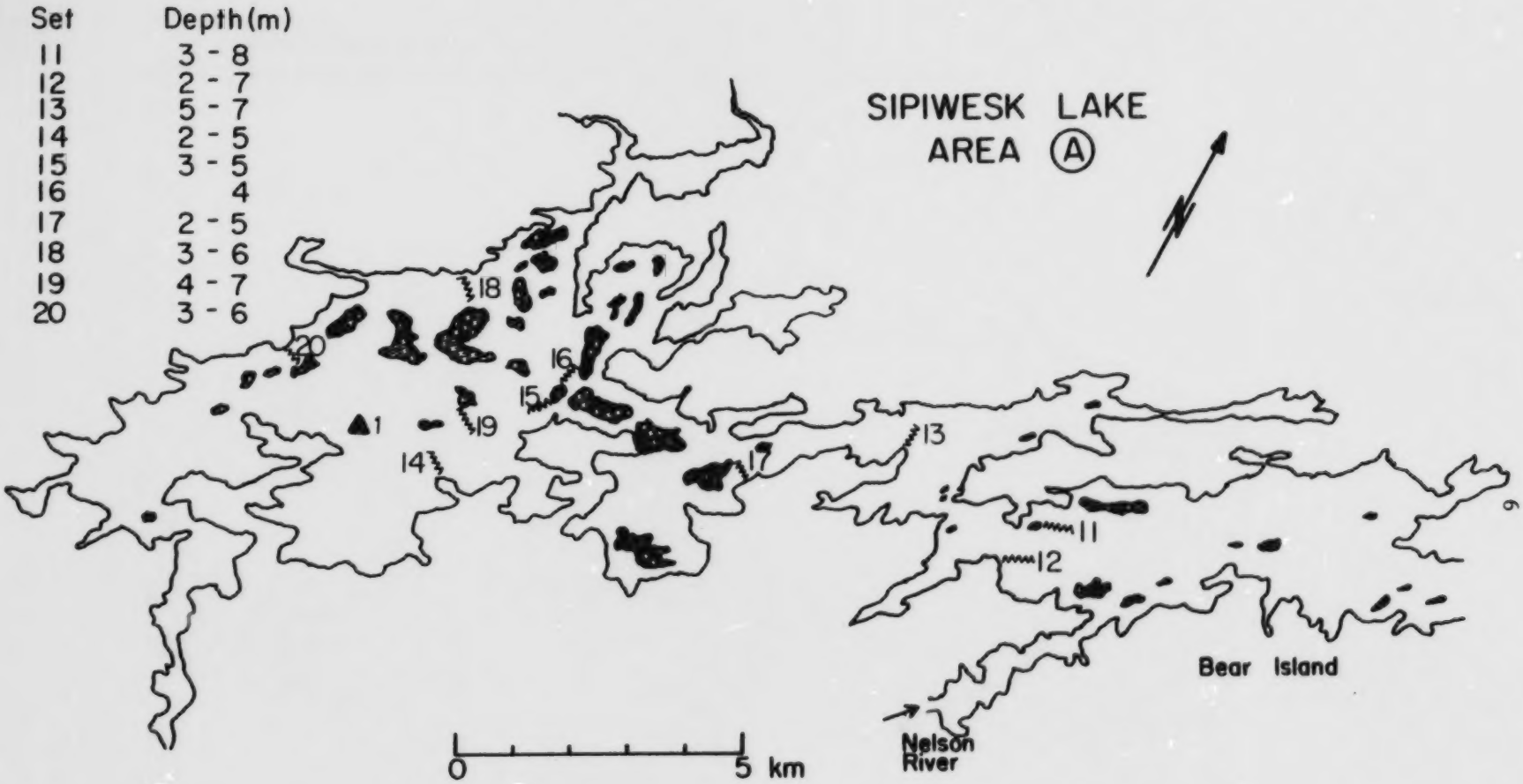

Fig. 2. Netting locations and depths of sets in Area A of Sipiwesk Lake, 1987.
▲1 = limnological sampling site.

Fig. 3. Netting locations and depths of sets in Area B of Sipiwesk Lake, 1987.
▲2 = limnological sampling site.

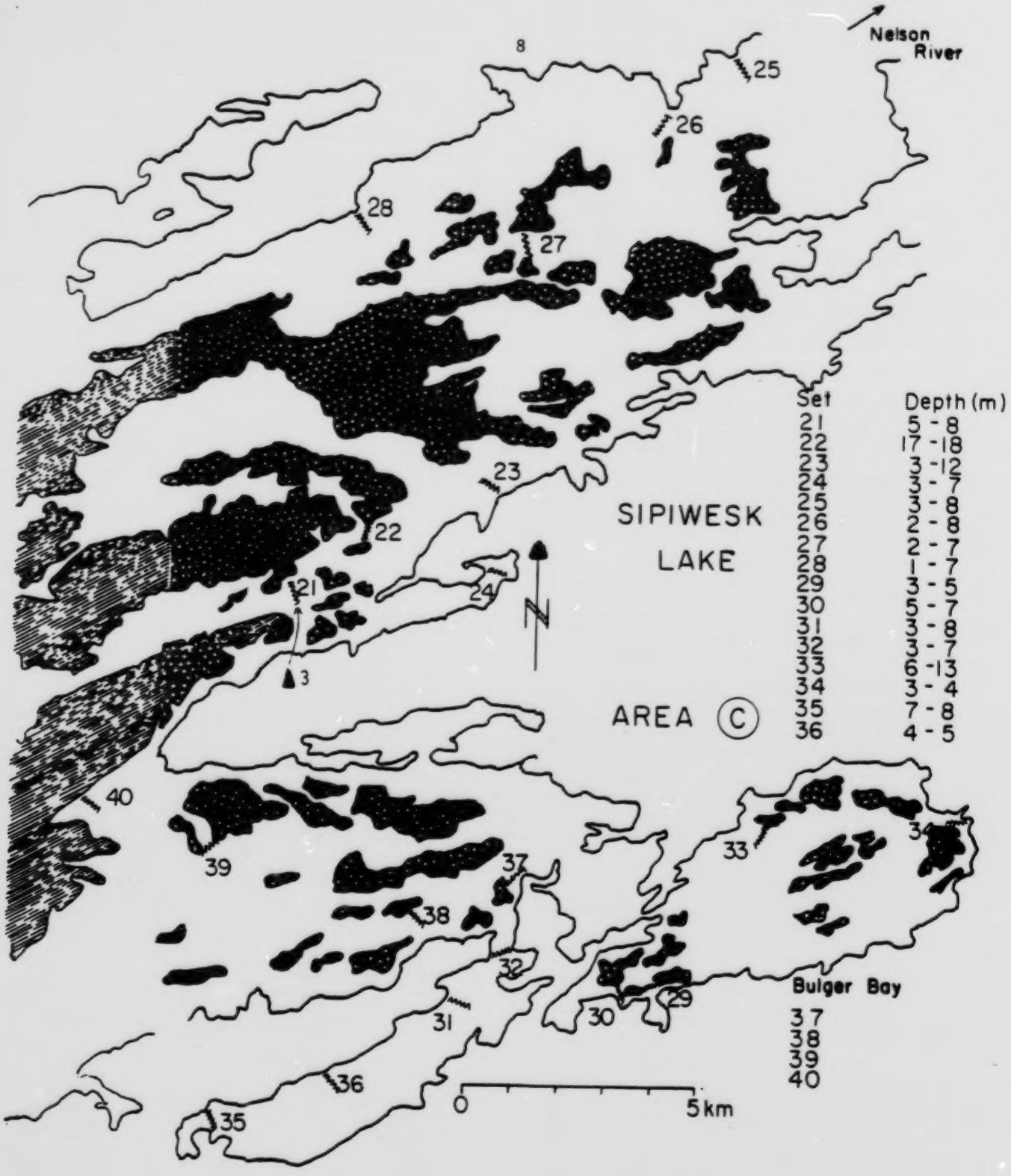

Fig. 4. Netting locations and depths of sets in Area C of Sipiwesk Lake, 1987. ▲3 = limnological sampling site.

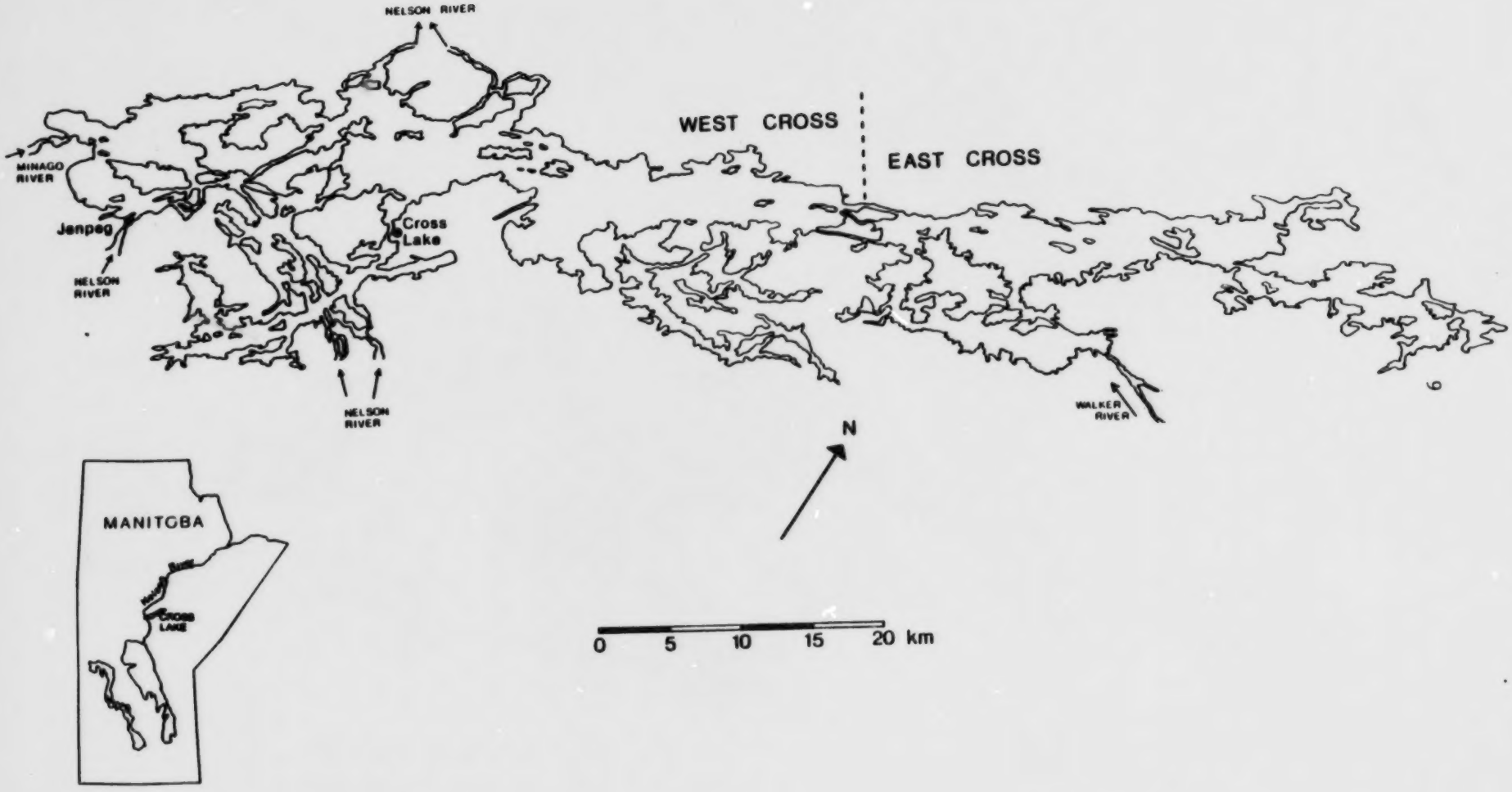

Fig. 5. Map showing location of Cross Lake and designated working areas used in 1987.

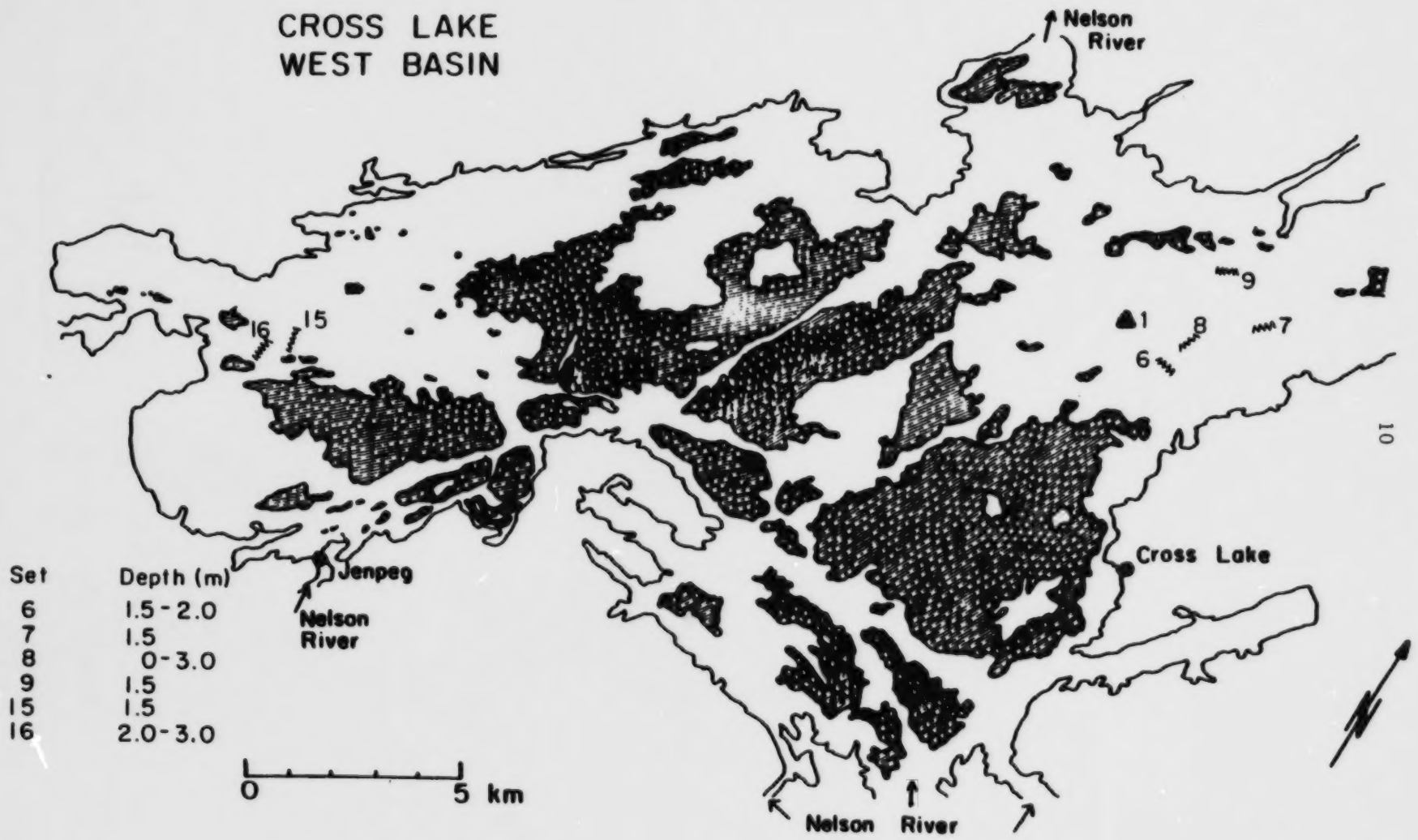

Fig. 6. Netting locations and depths of sets from Cross Lake west basin, 1987.
▲1 = limnological sampling site.

Fig. 7. Netting locations in the whiskeyjack basin of Cross Lake, 1987.

Fig. 8. Netting locations and depths of sets from Cross Lake middle basin, 1987. ▲2 = limnological sampling site.

Fig. 9. Netting locations and depths of sets from Cross Lake east basin, 1987.
▲3 = limnological sampling site.

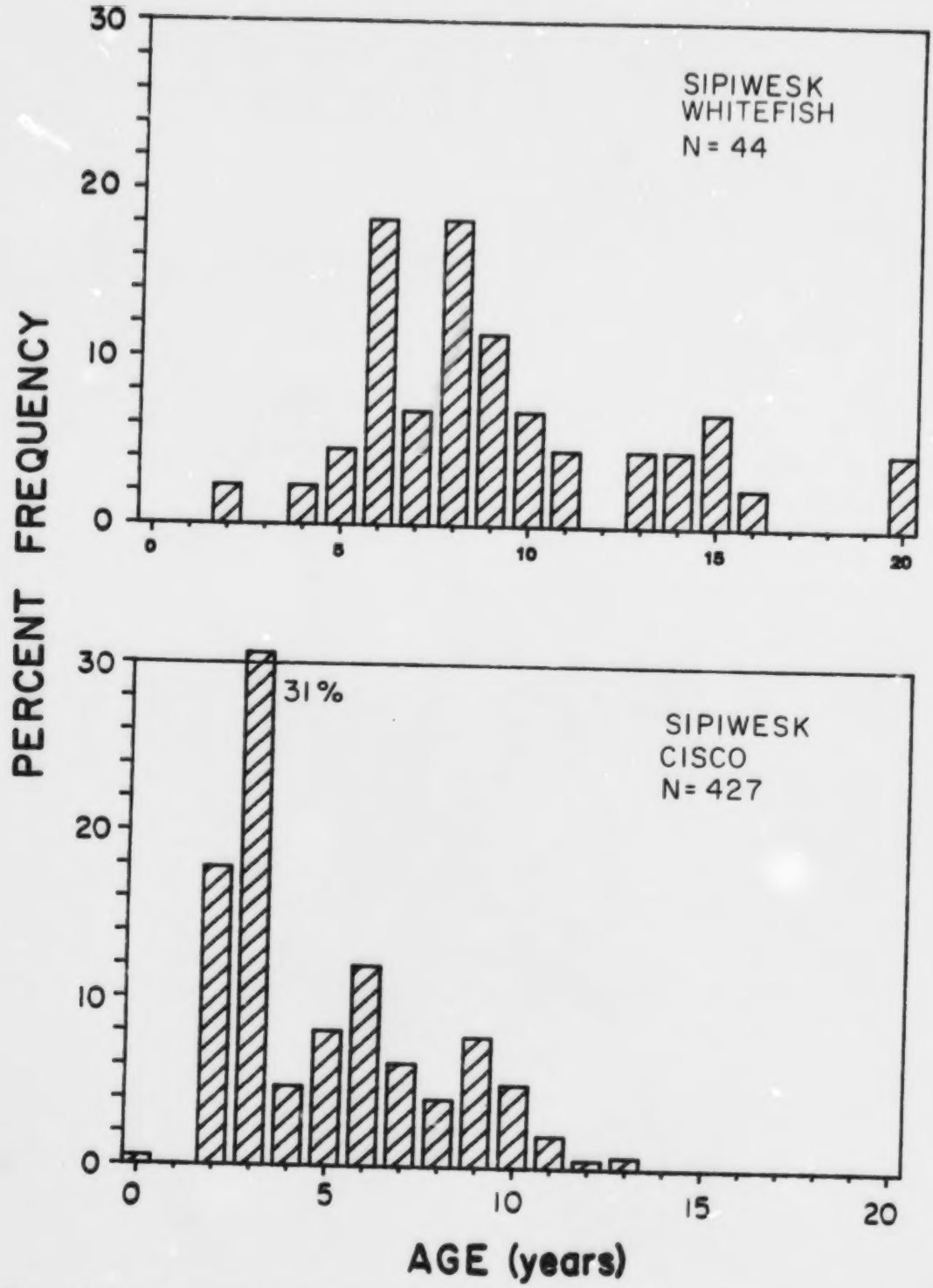

Fig. 10. Age compositions for whitefish and cisco from Sipiwesk Lake, 1987.

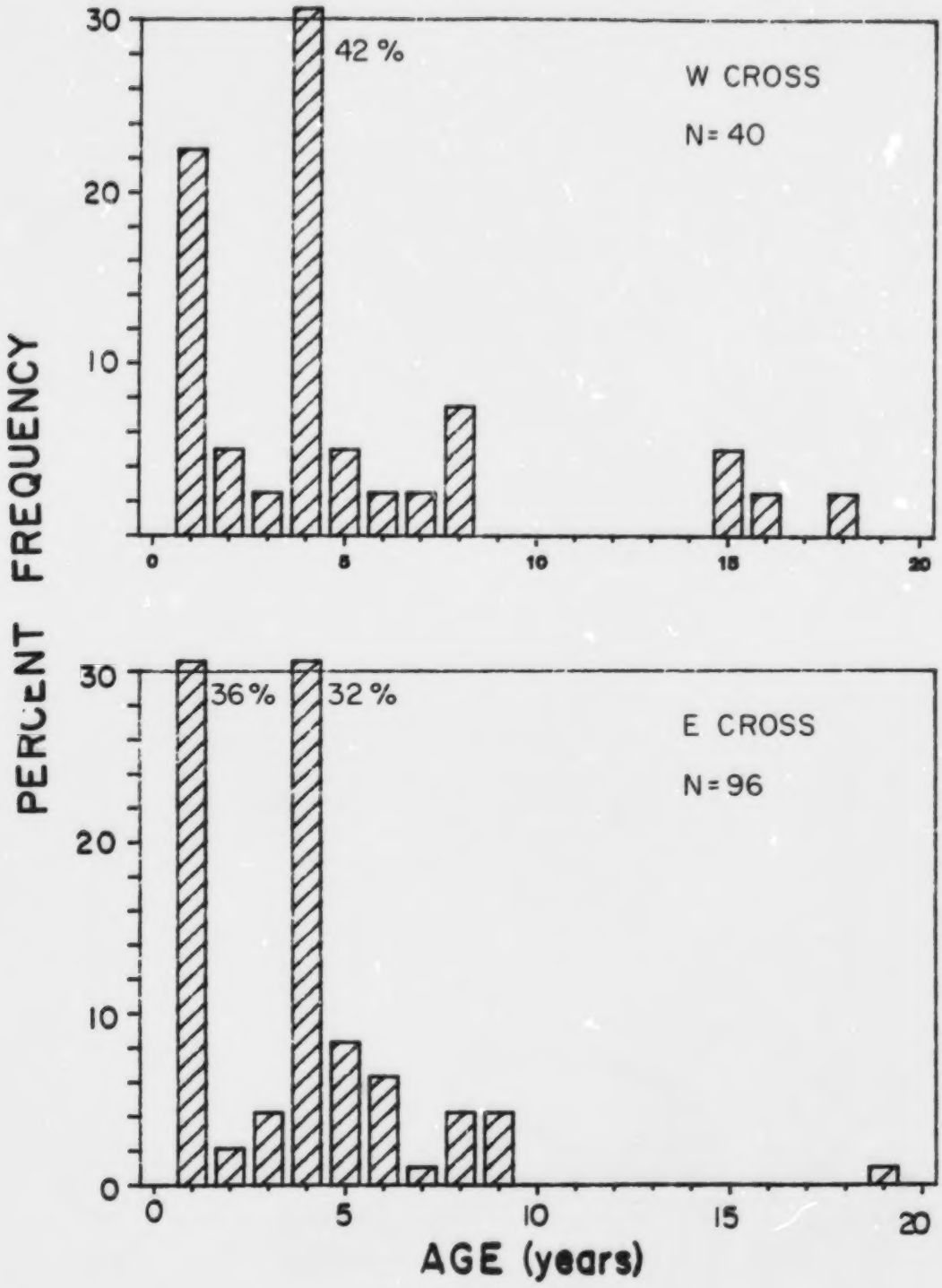

Fig. 11. Age compositions for whitefish from West and East Cross lakes, 1987.

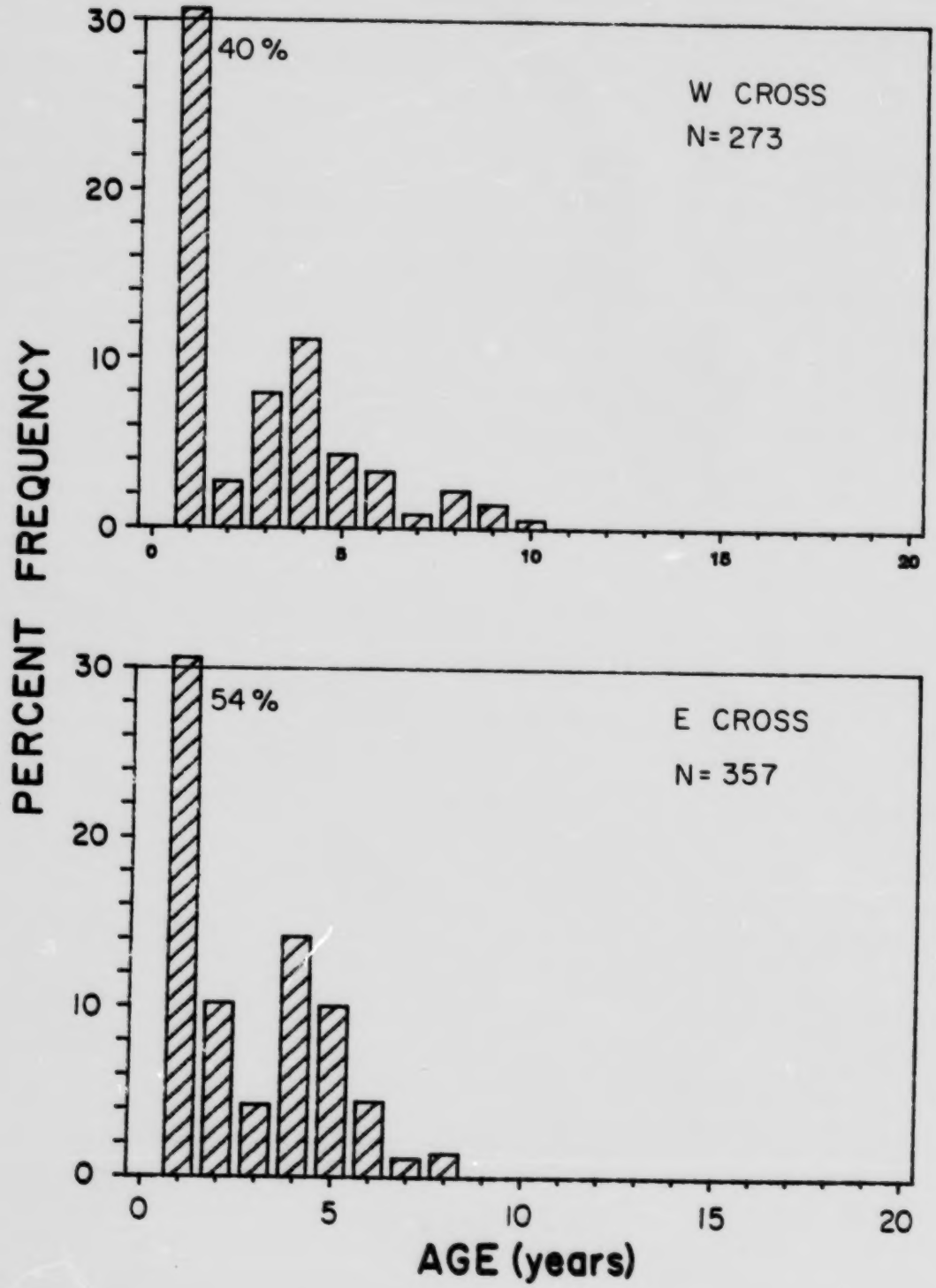

Fig. 12. Age compositions for cisco from West and East Cross lakes, 1987.

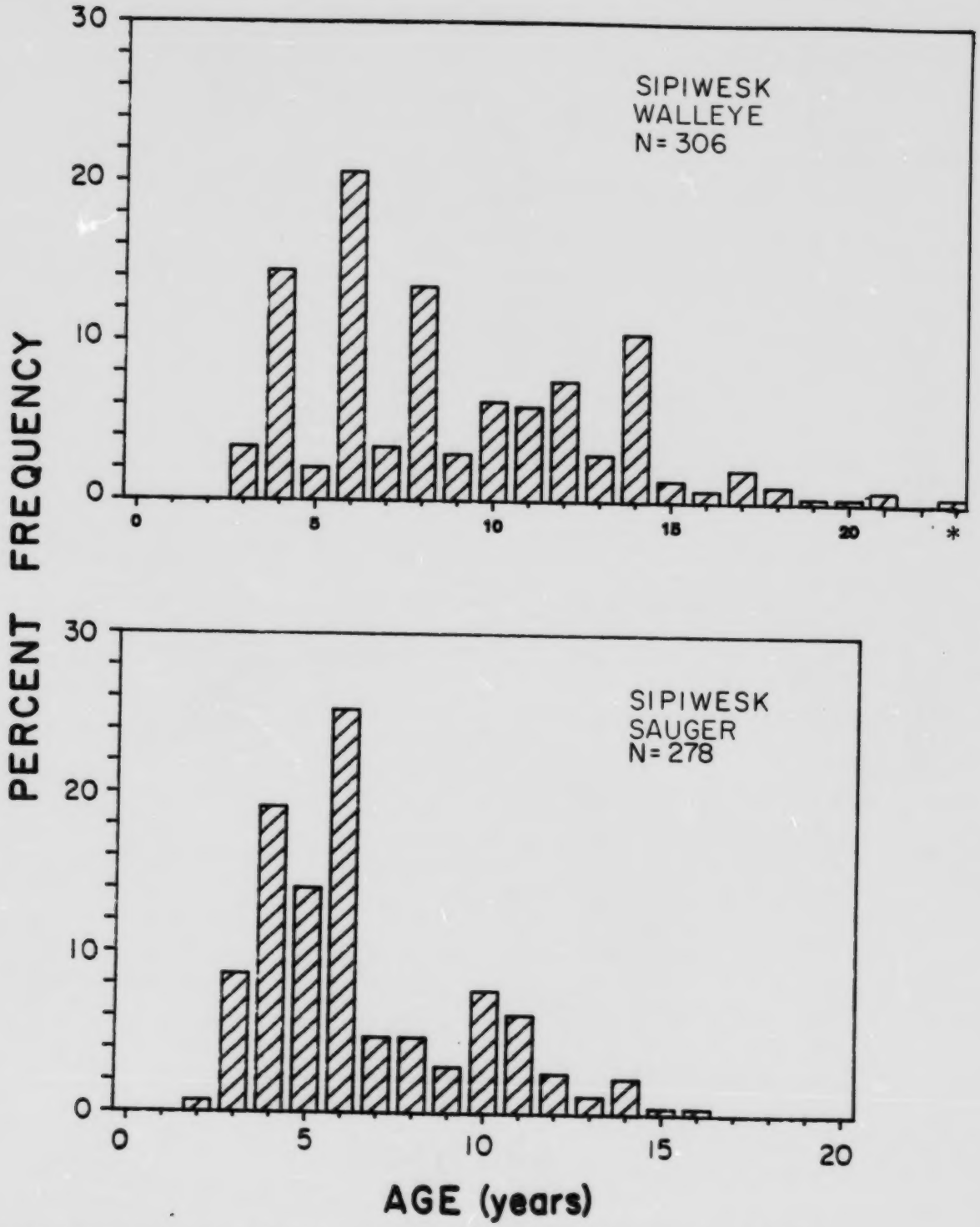

Fig. 13. Age compositions for walleye and sauger from Sipiwesk Lake, 1987.
* represents percentage for each age of 23, 24 and 26.

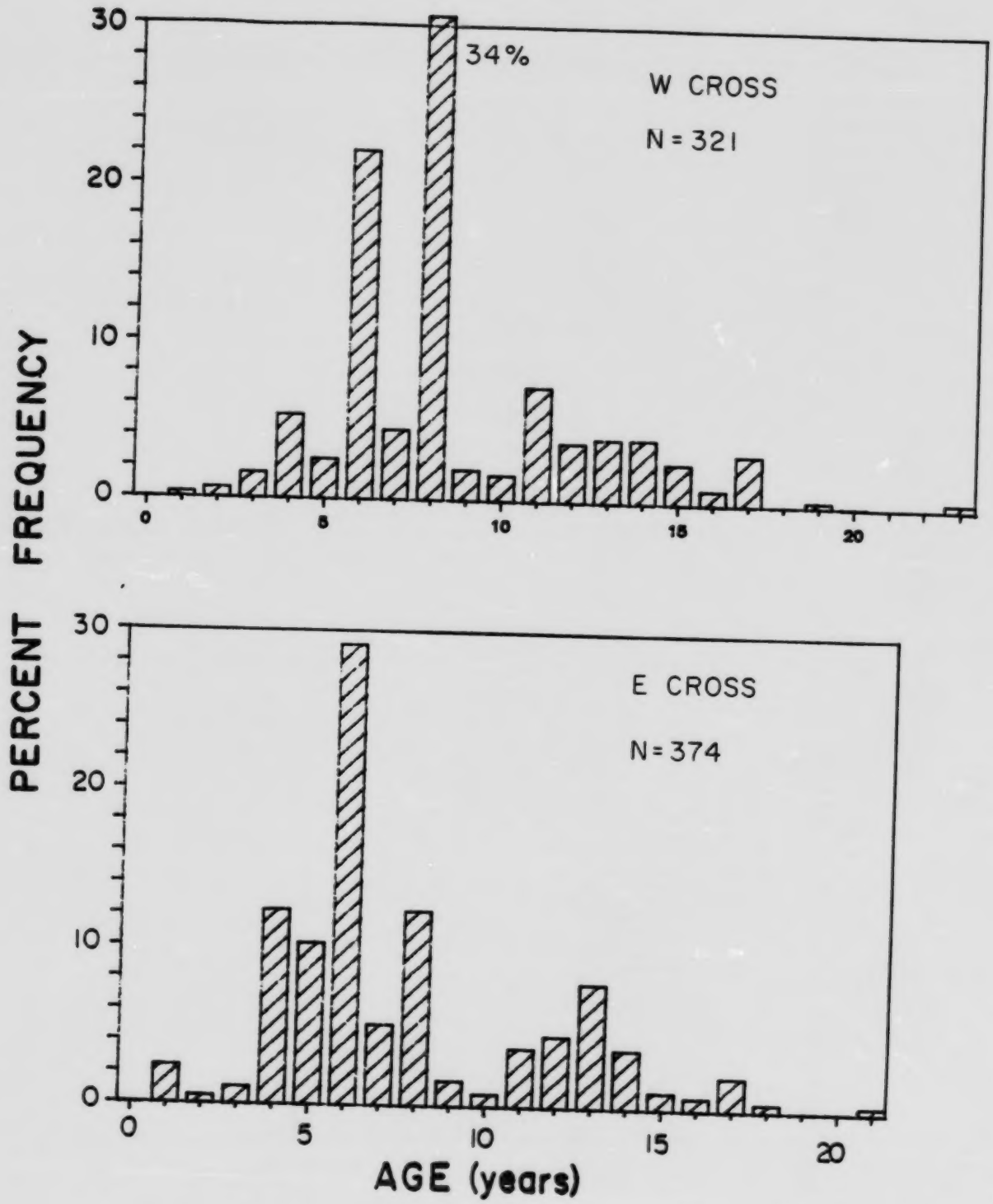

Fig. 14. Age compositions for walleye from West and East Cross lakes, 1987.

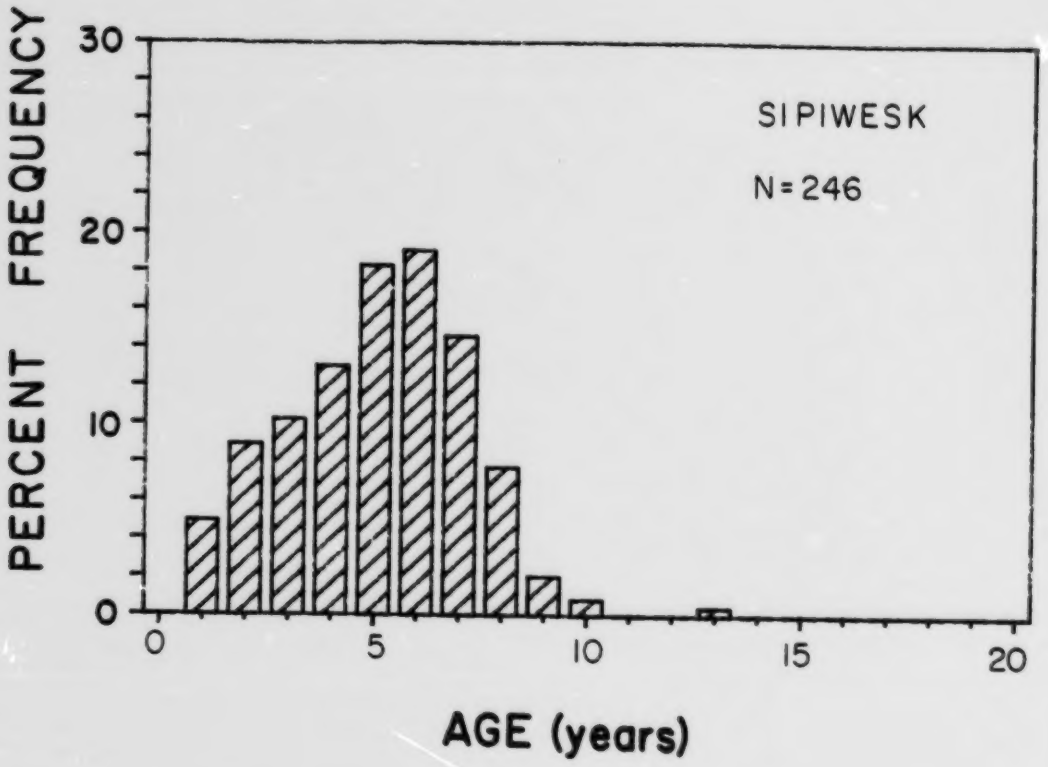

Fig. 15. Age composition for northern pike from Sipiwesk Lake, 1987.

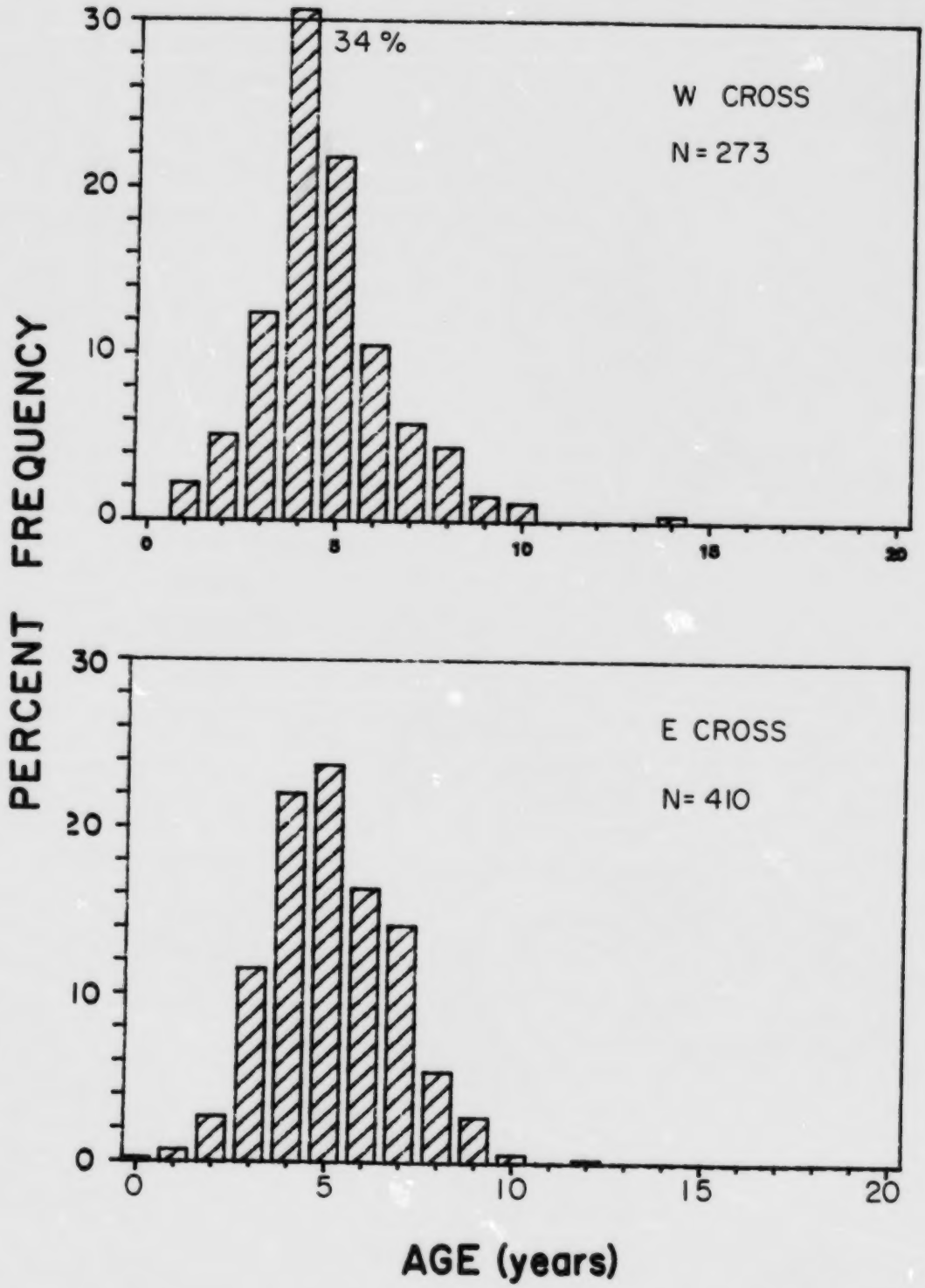

Fig. 16. Age compositions for northern pike from West and East Cross lakes, 1987.

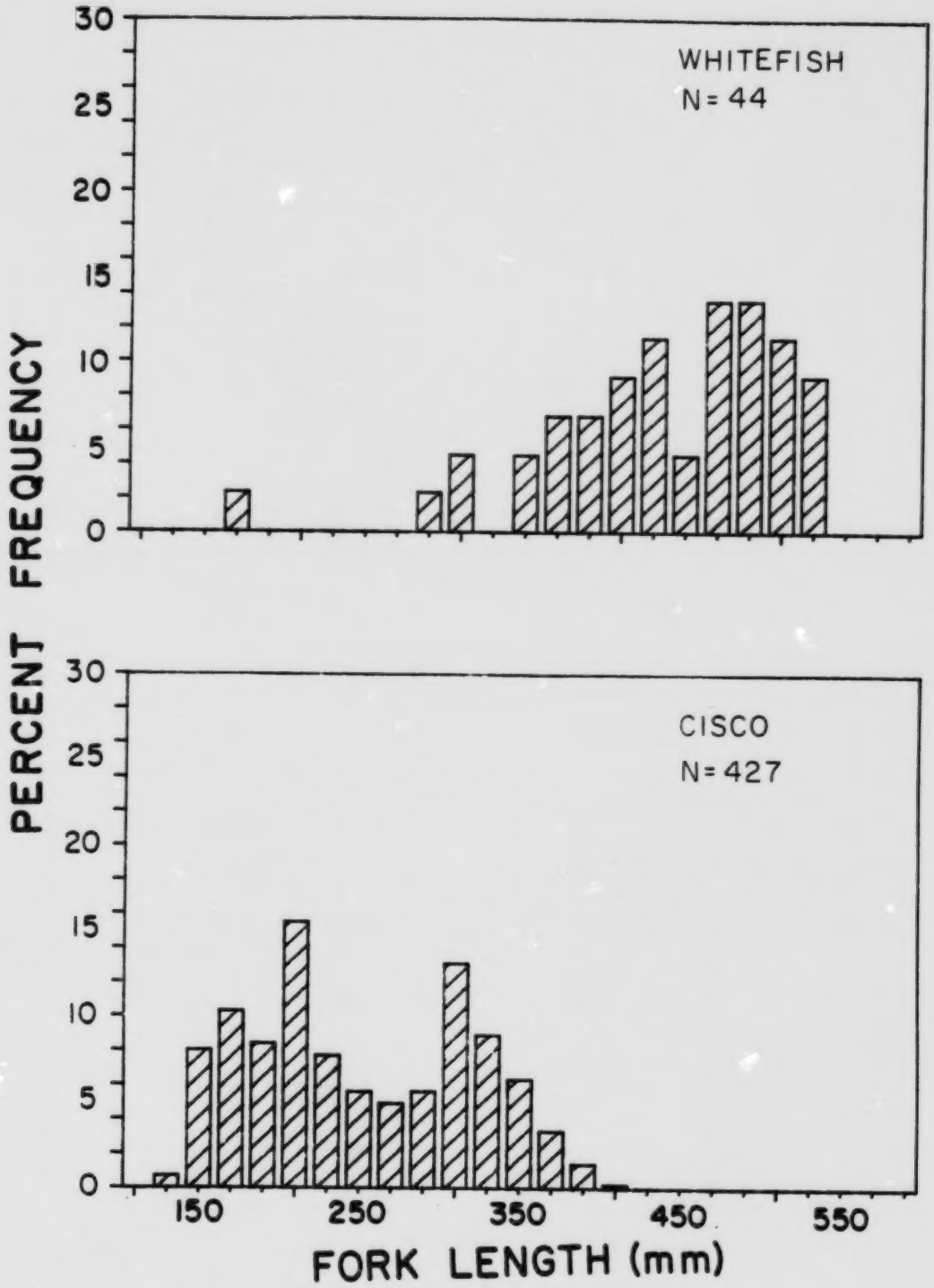

Fig. 17. Fork length frequencies for whitefish and cisco from Sipiwesk Lake, 1987.

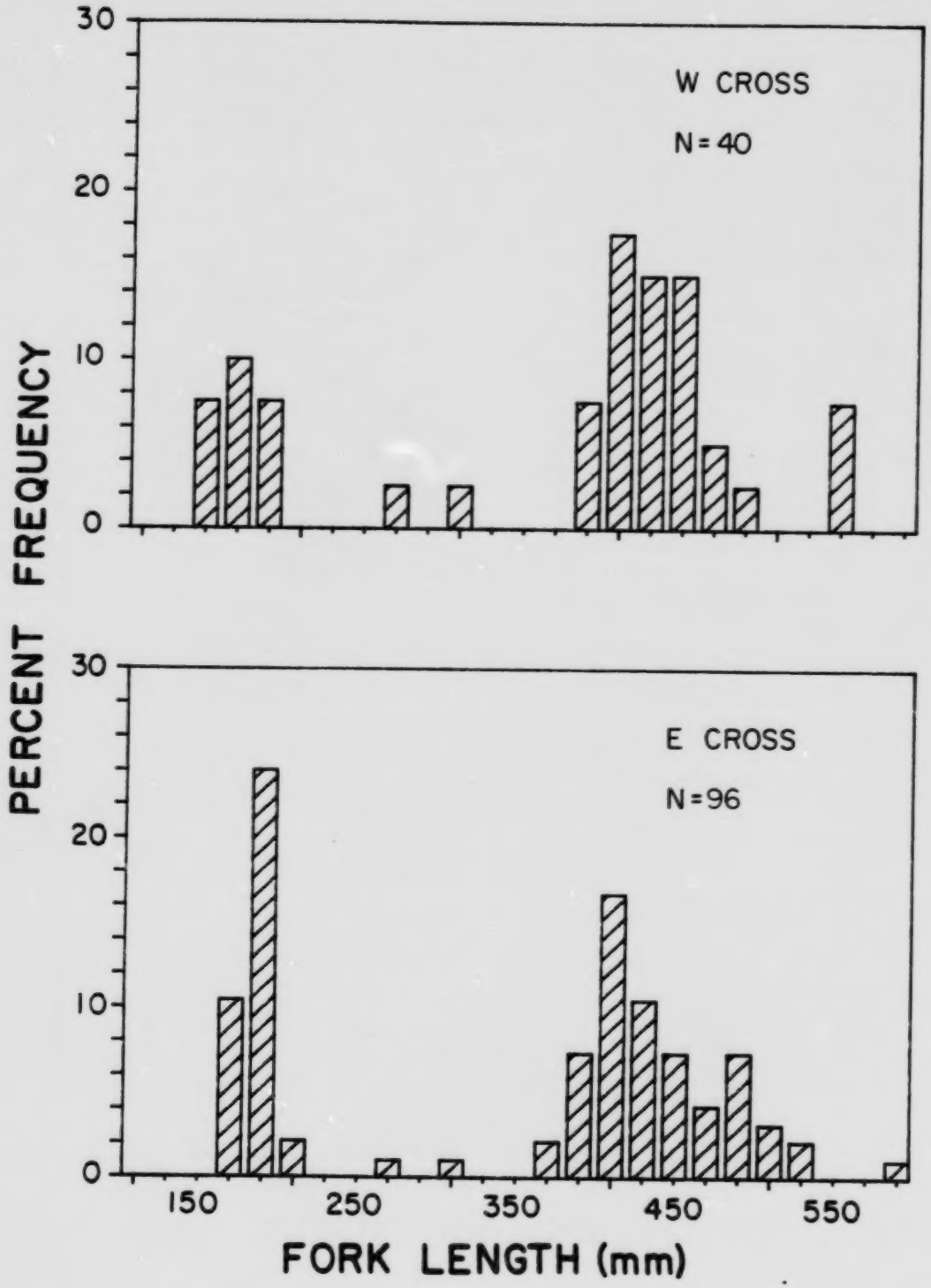

Fig. 18. Fork length frequencies for whitefish from West and East Cross lakes, 1987.

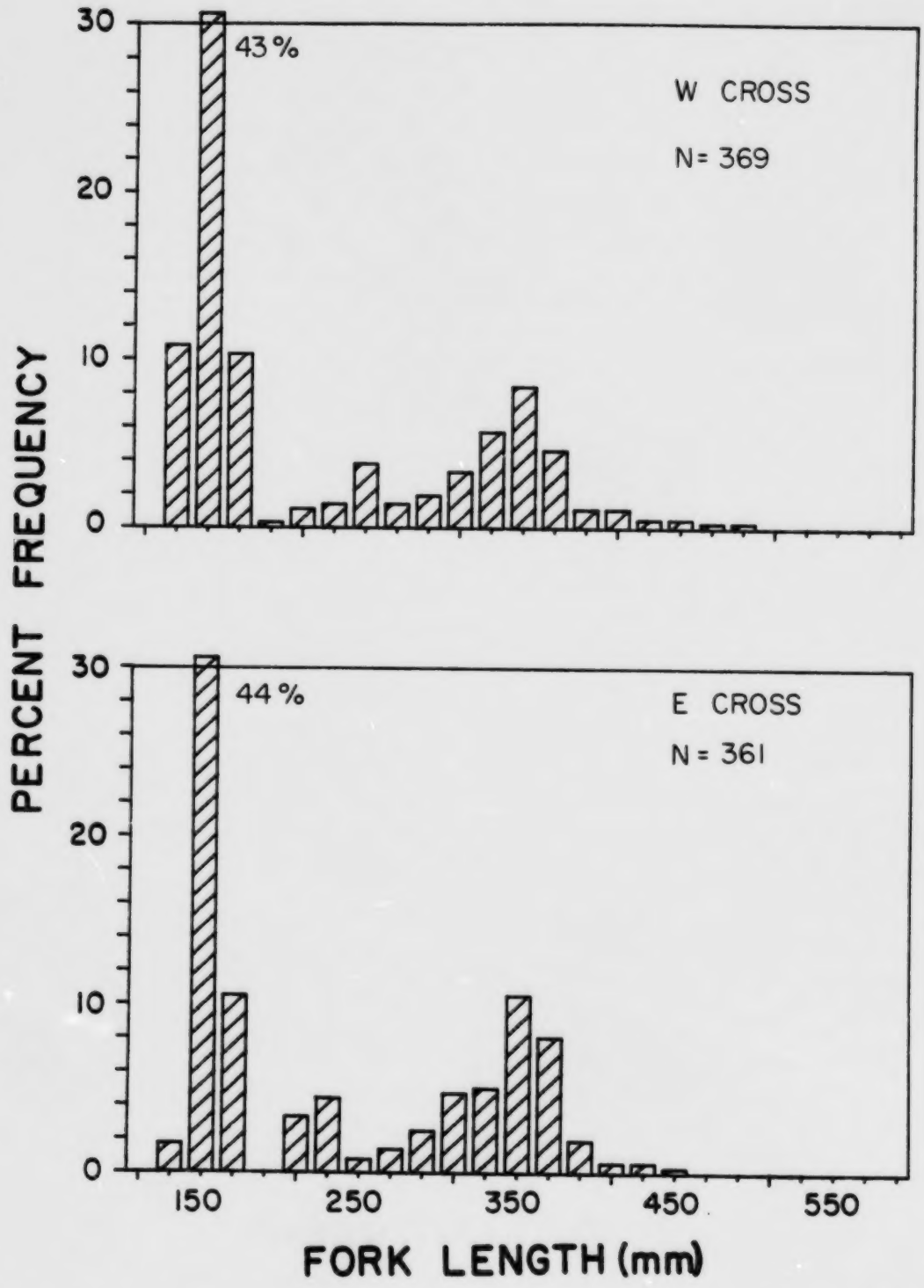

Fig. 19. Fork length frequencies for cisco from West and East Cross lakes, 1987.

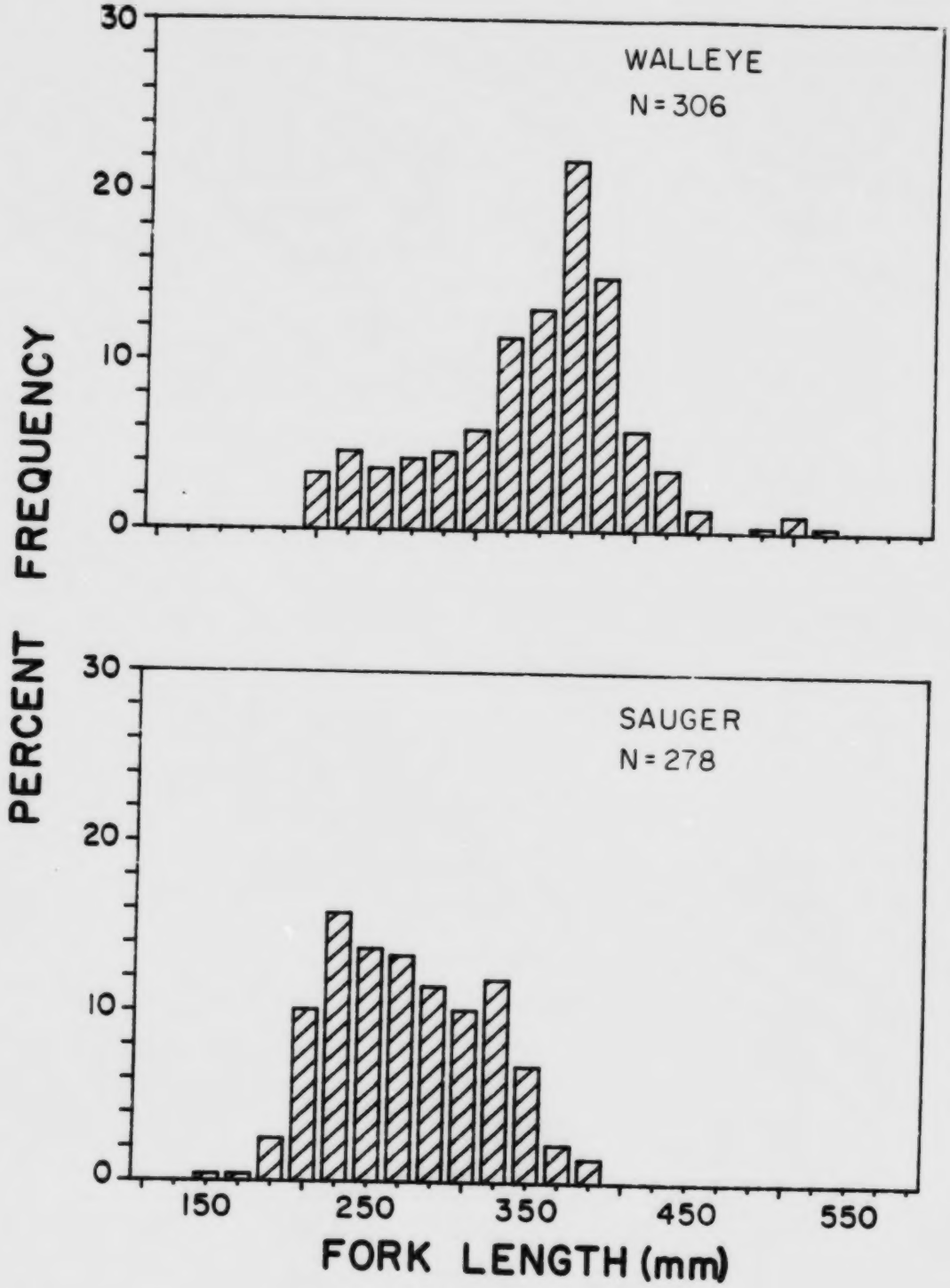

Fig. 20. Fork length frequencies for walleye and sauger from Sipiwesk Lake, 1987.

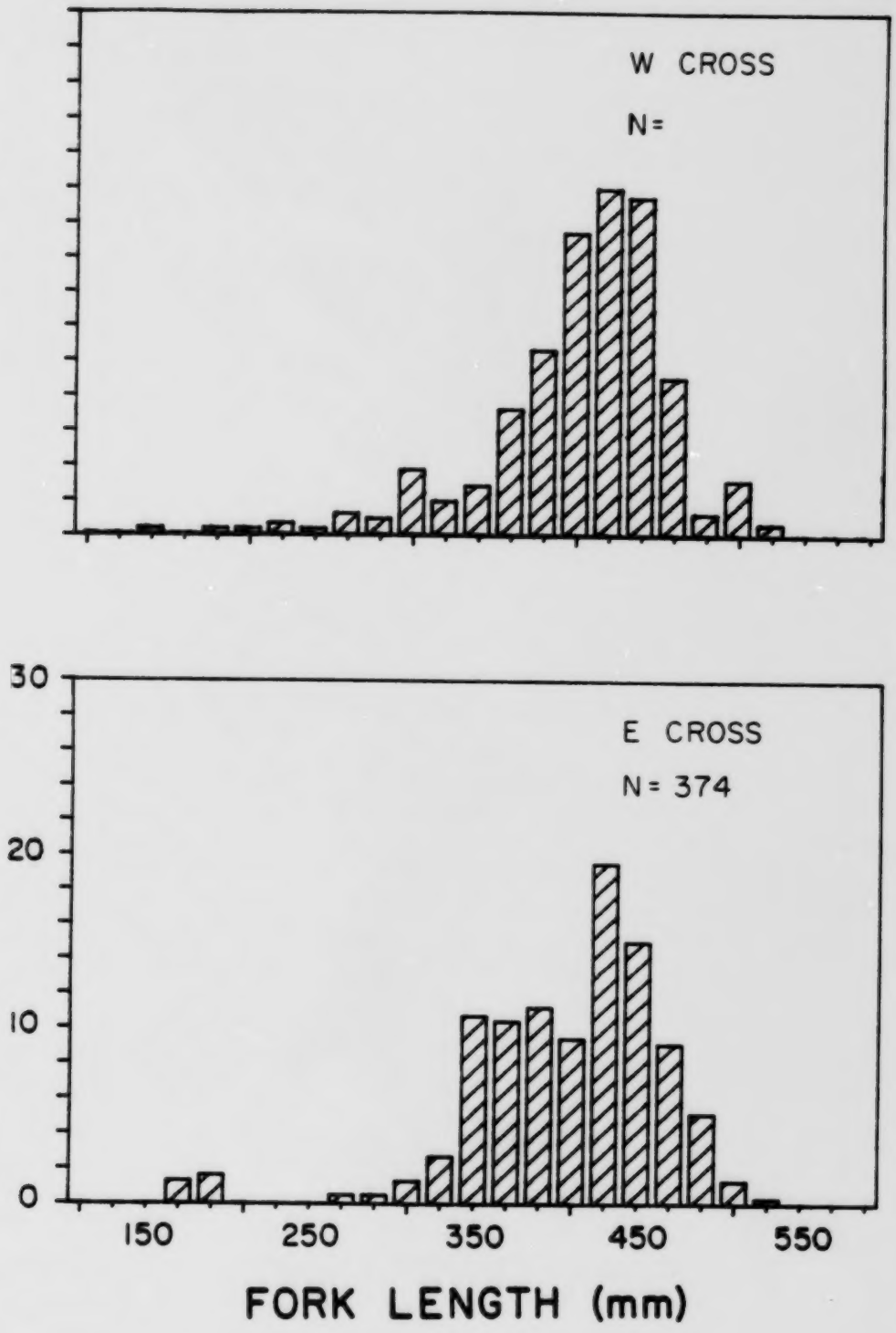

Fig. 21. Fork length frequencies for walleye from West and East Cross lakes, 1987.

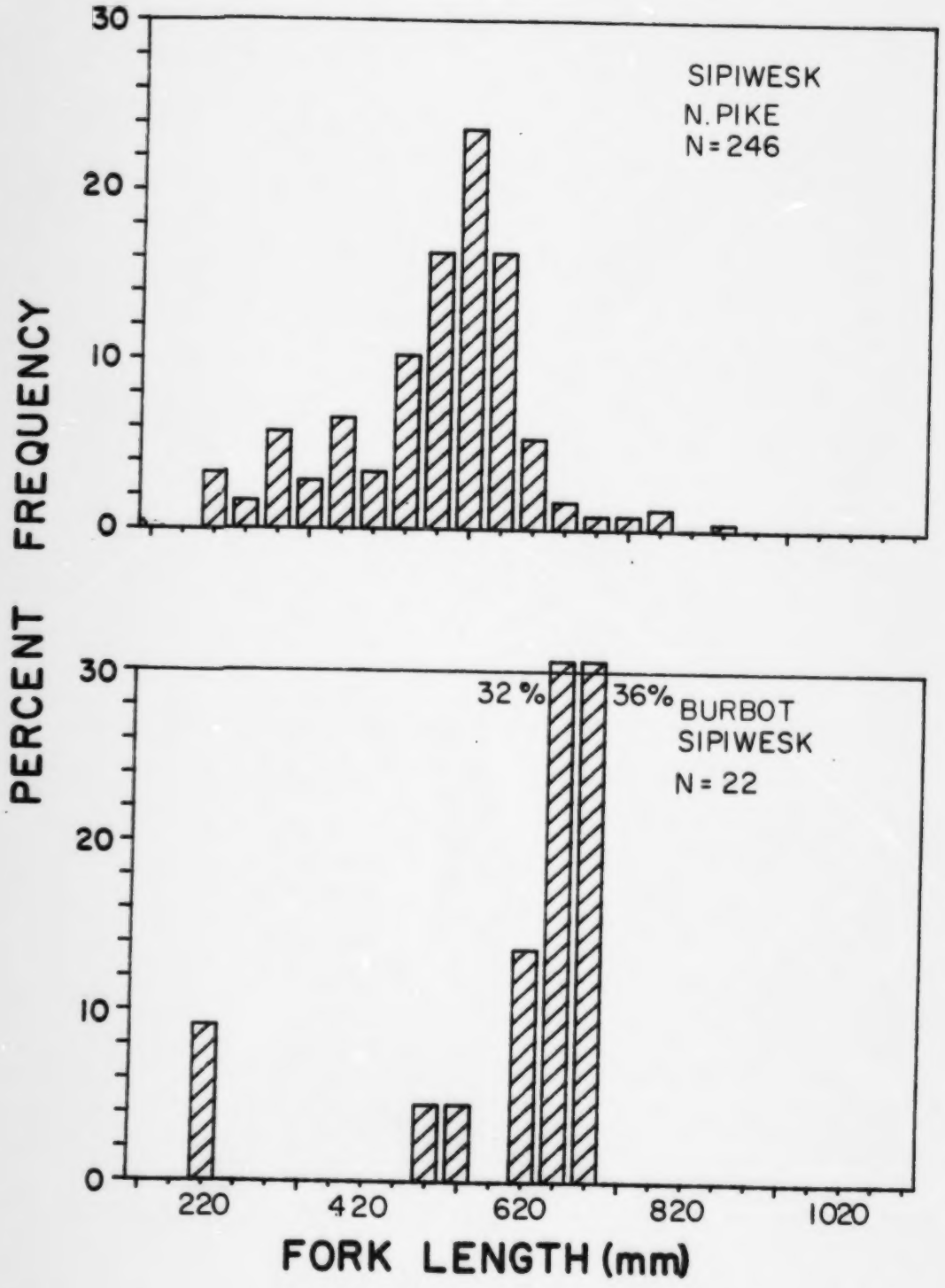

Fig. 22. Fork length frequencies for northern pike and burbot from Sipiwesk Lake, 1987.

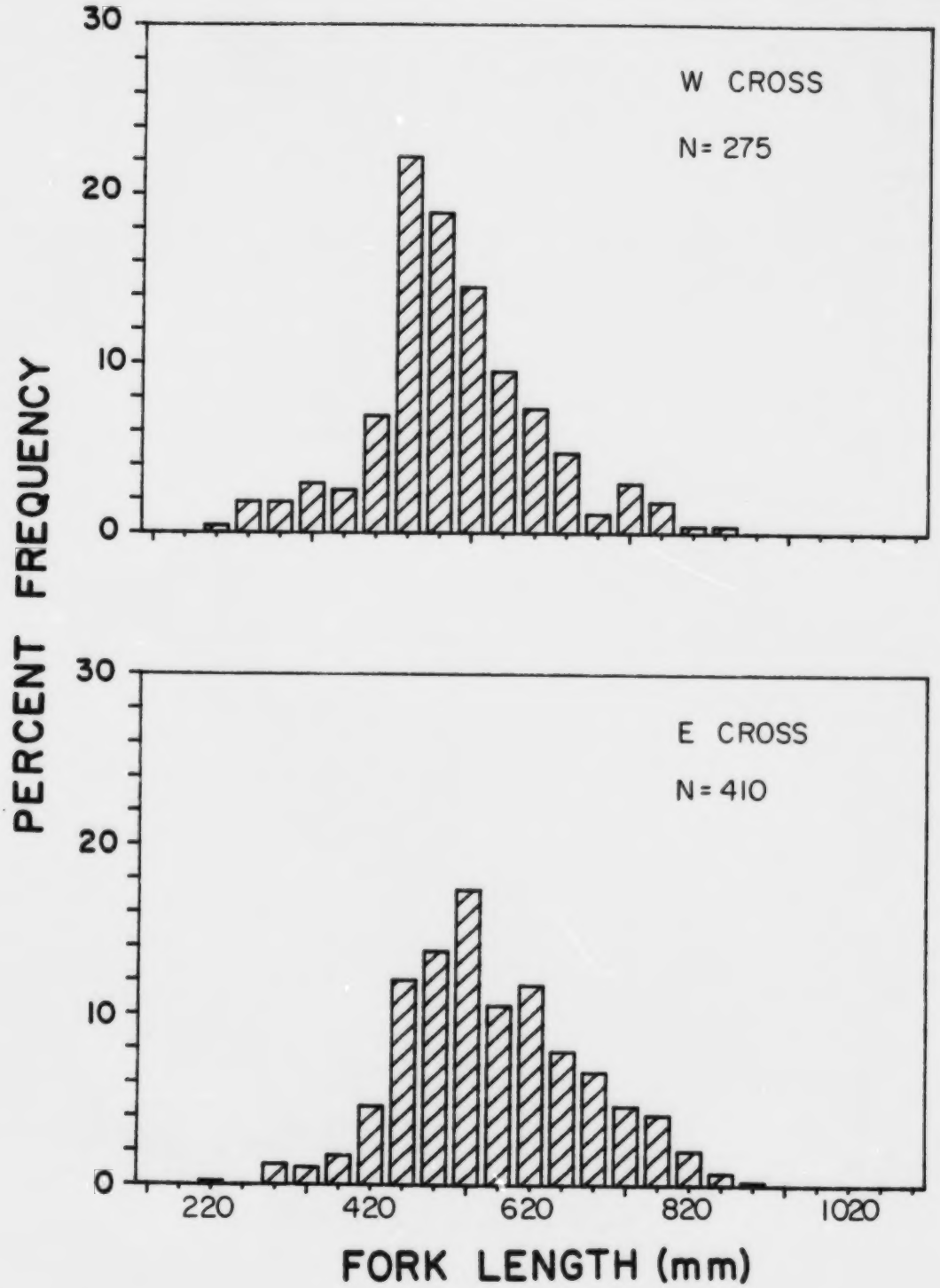

Fig. 23. Fork length frequencies for northern pike from West and East Cross lakes, 1987.

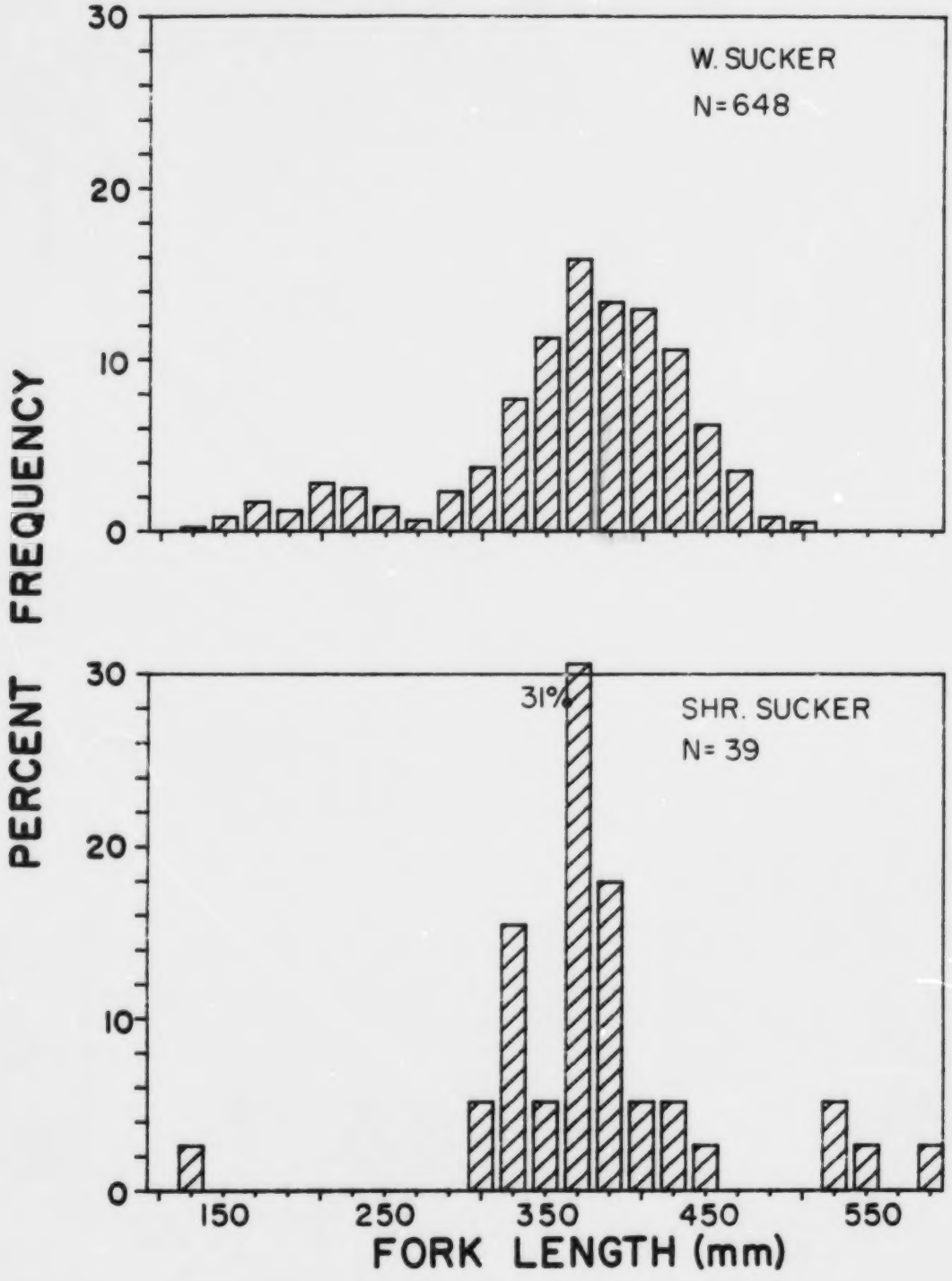

Fig. 24. Fork length frequencies for white sucker and shorthead redhorse sucker from Sipiwesk Lake, 1987.

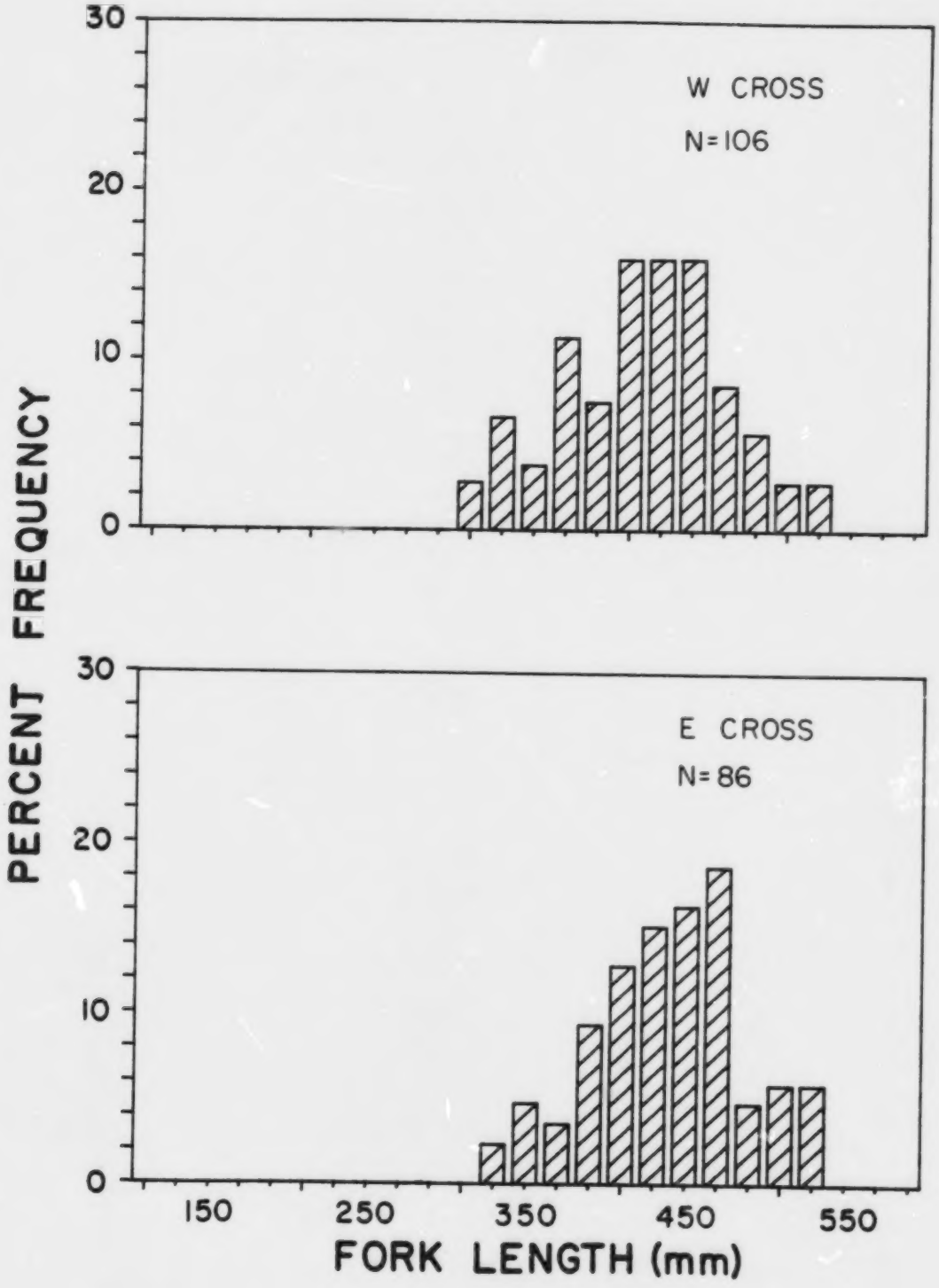

Fig. 25. Fork length frequencies for white sucker from West and East Cross lakes, 1987.

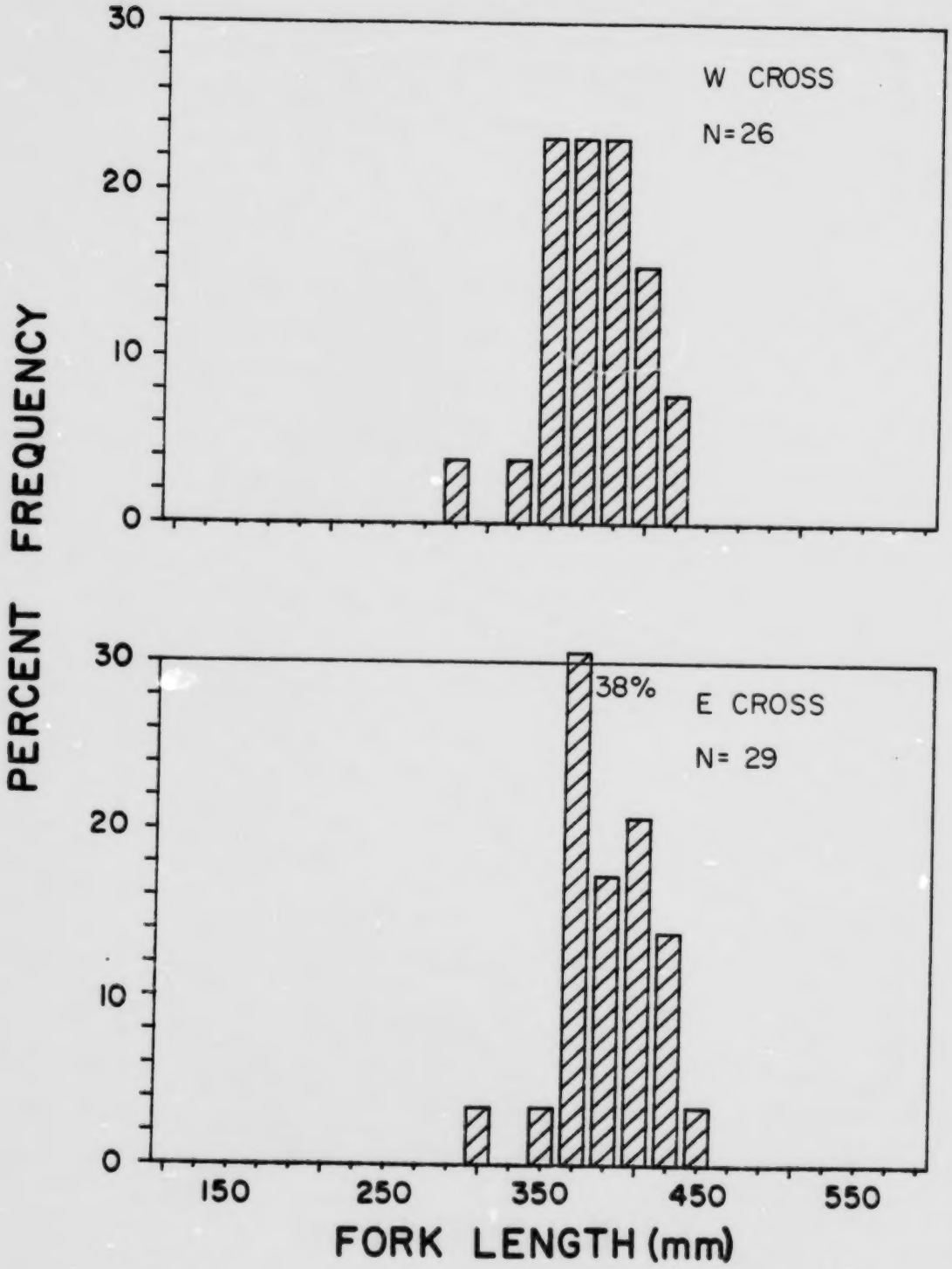

Fig. 26. Fork length frequencies for shorthead redhorse sucker from West and East Cross lakes, 1987.

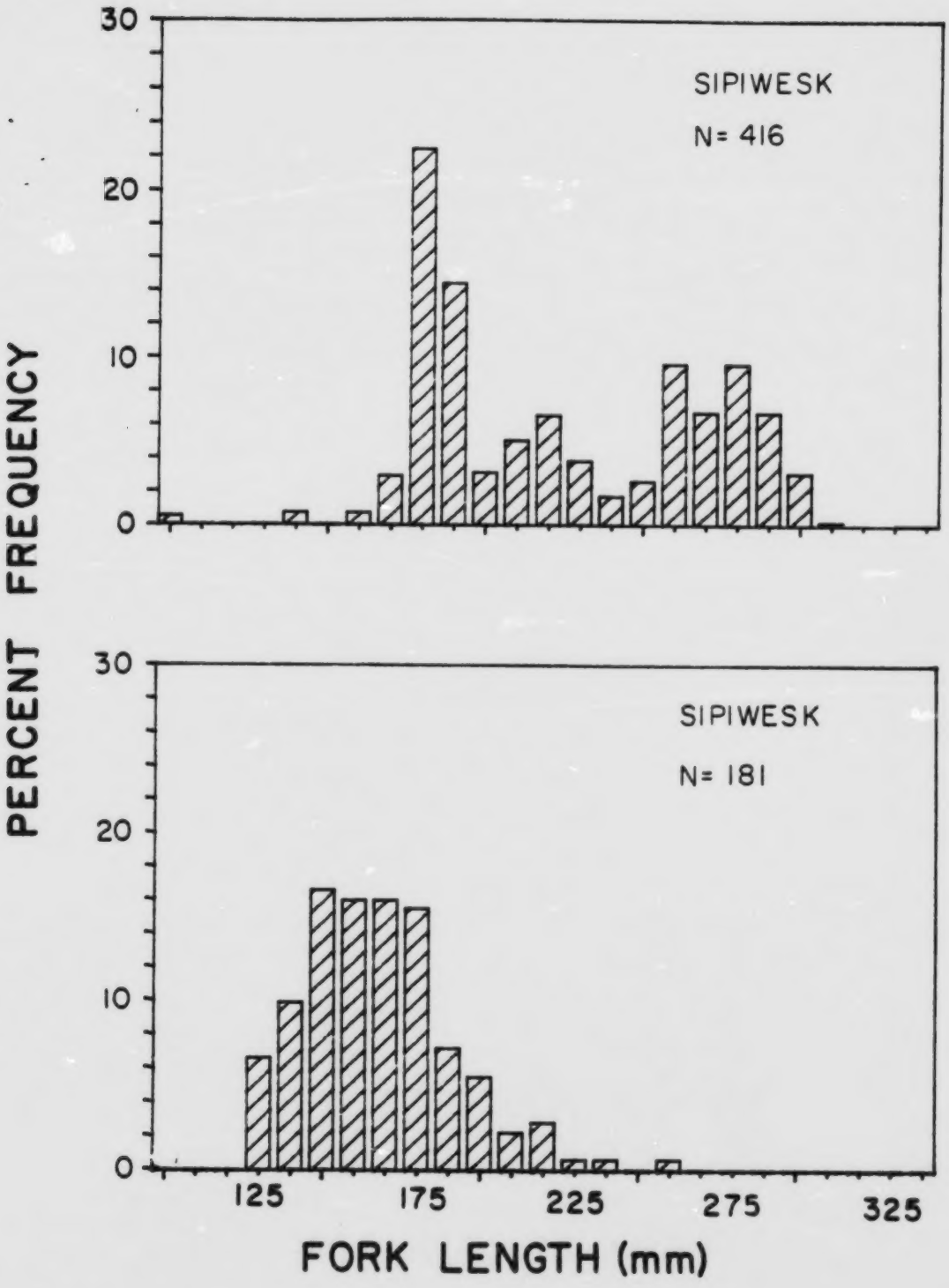

Fig. 27. Fork length frequencies for mooneye and yellow perch from Sipiwesk Lake, 1987.

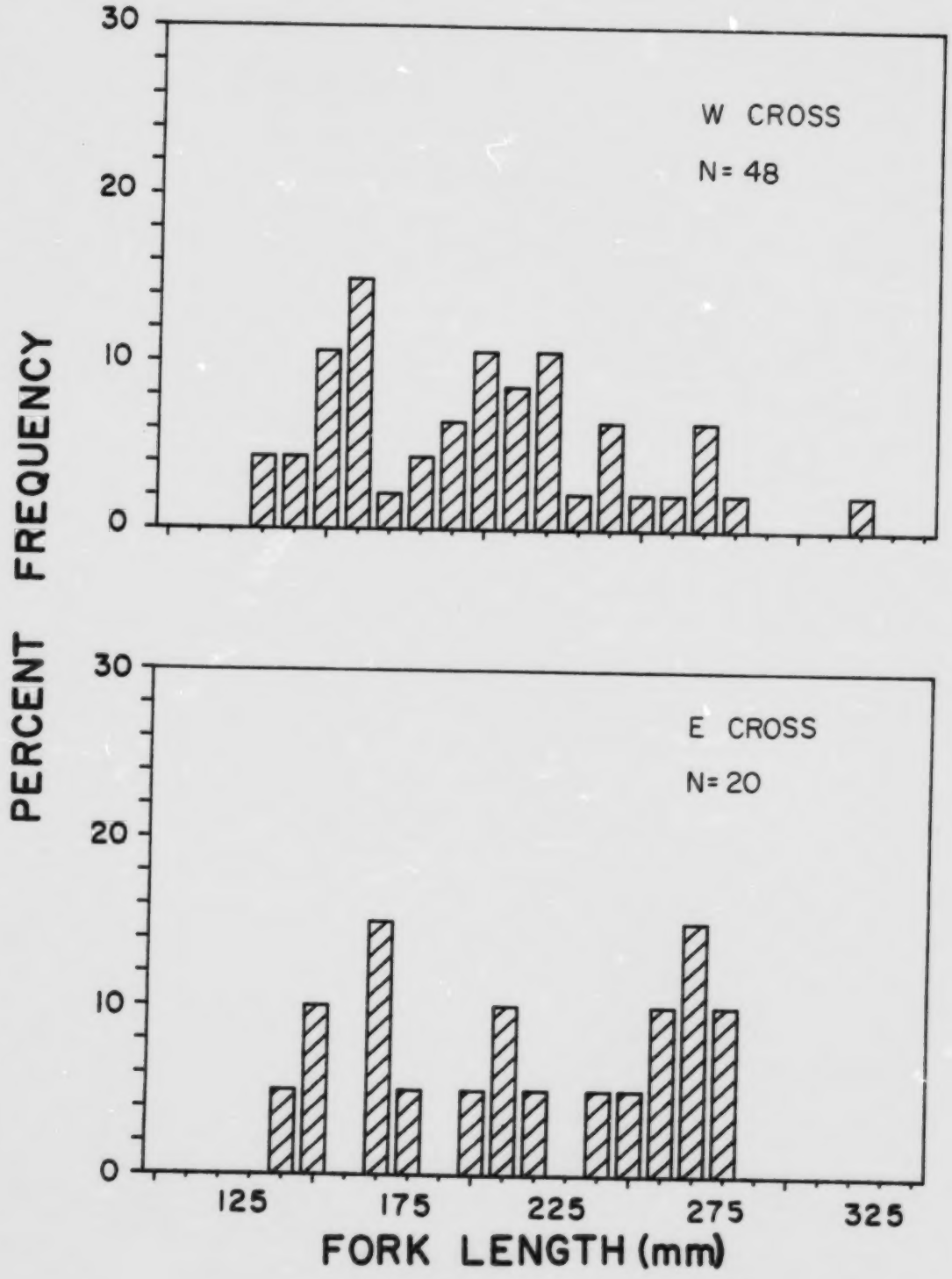

Fig. 28. Fork length frequencies for yellow perch from West and East Cross lakes, 1987.

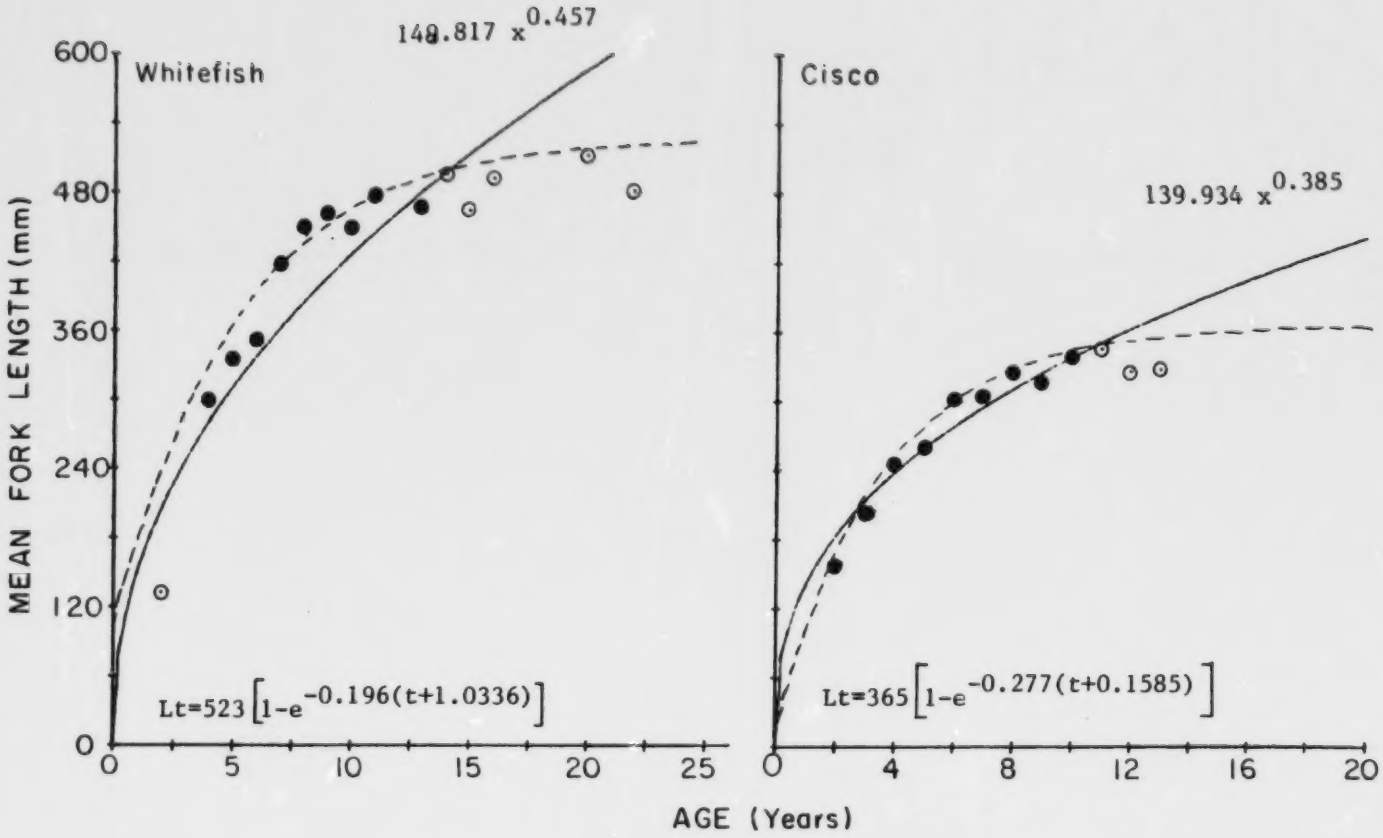

Fig. 29. Growth curves for whitefish and cisco from Sipiwesk Lake, 1987.
● = excluded from Walford and Brody analysis.

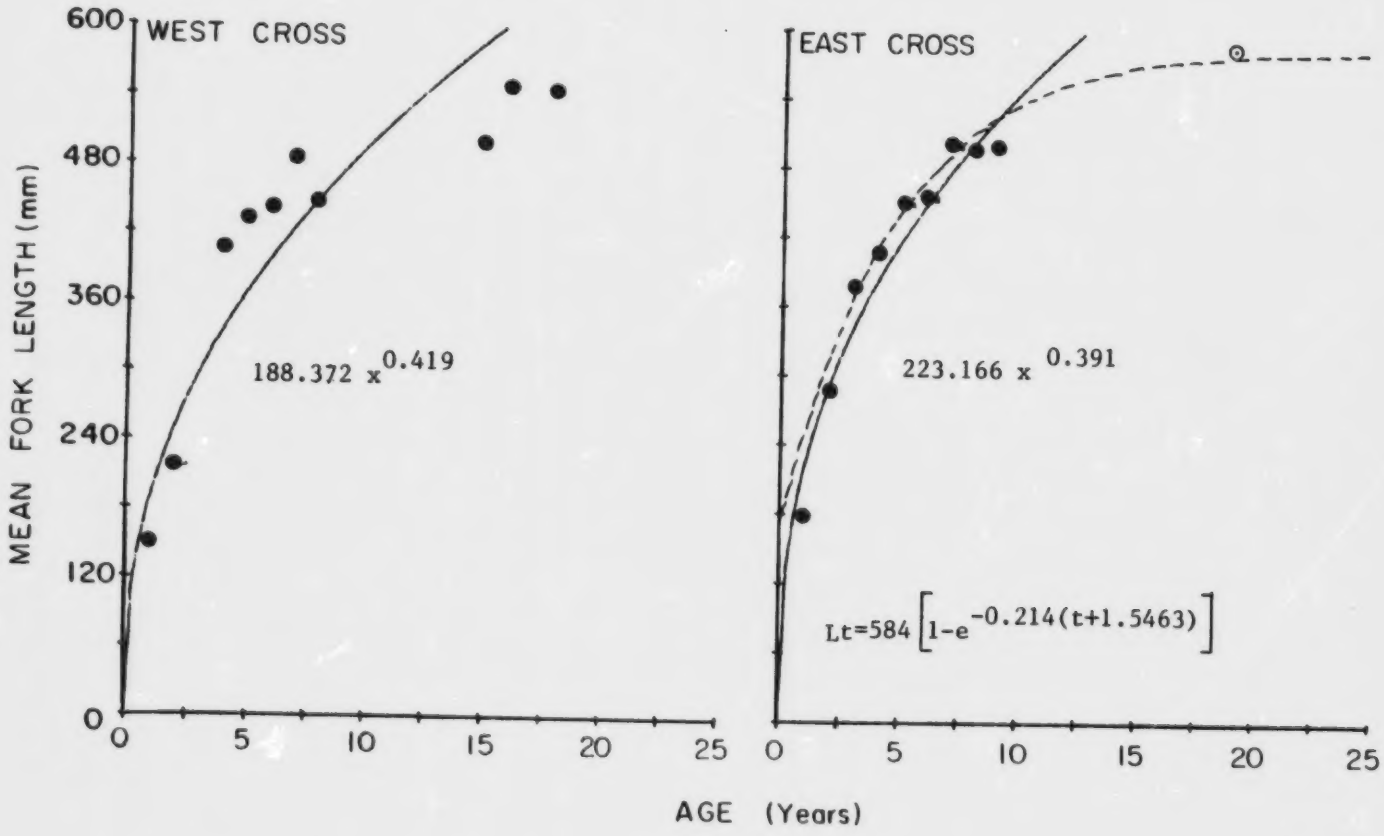

Fig. 30. Growth curves for whitefish from West and East Cross lakes, 1987.
⊙ = excluded from Walford and Brody analysis.

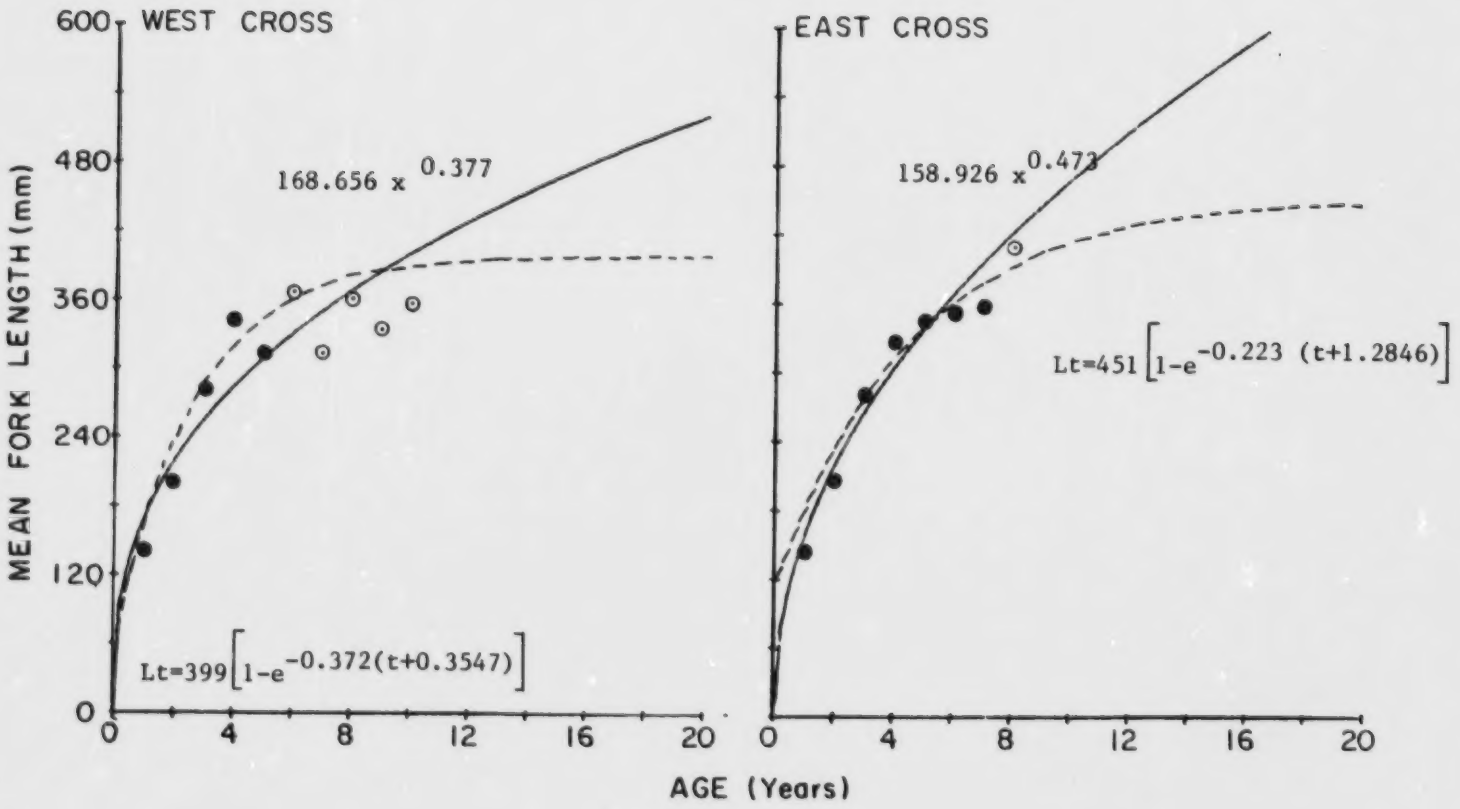

Fig. 31. Growth curves for cisco from West and East Cross lakes, 1987.
⊙ = excluded from Walford and Brody analysis.

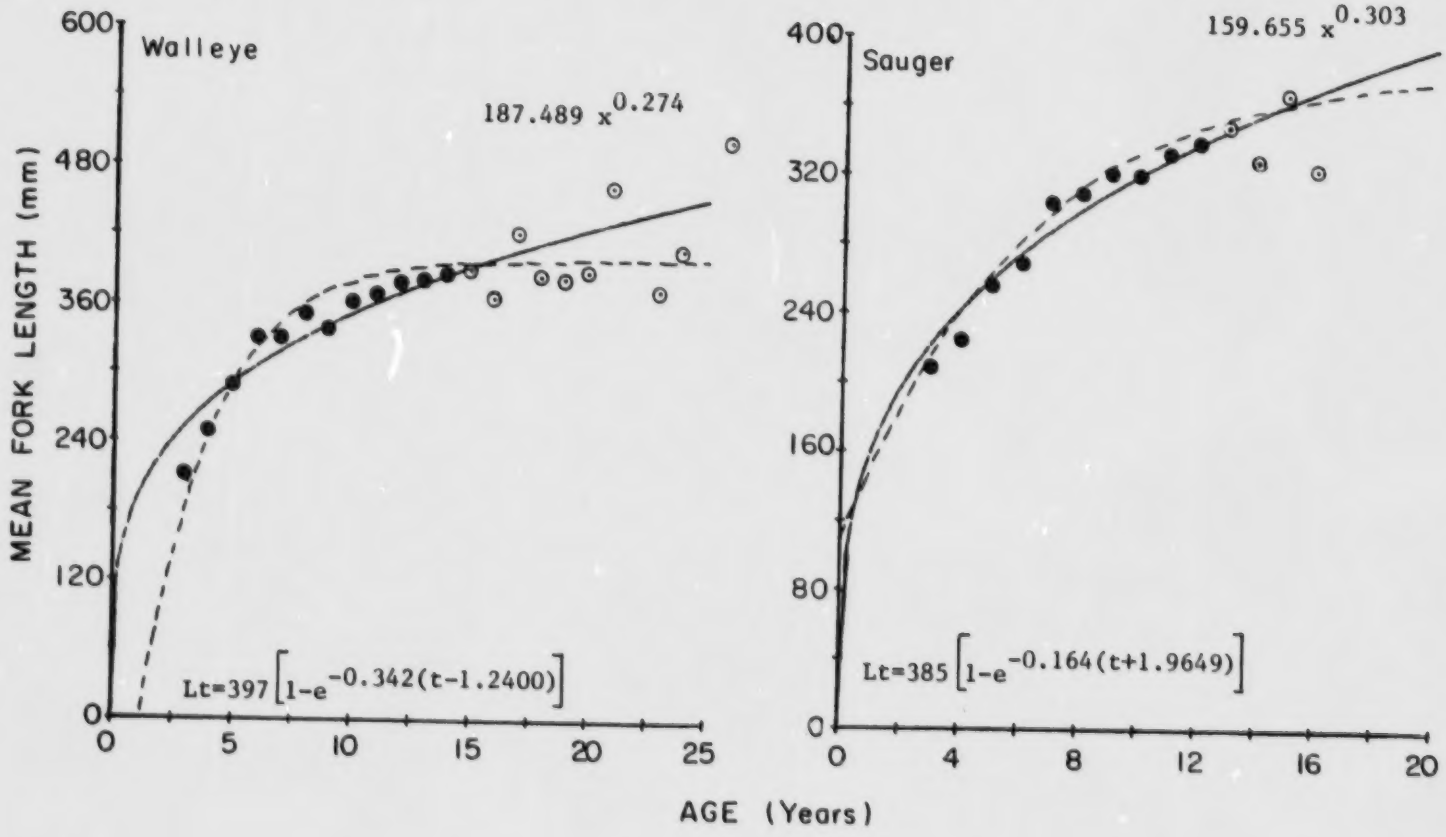

Fig. 32. Growth curves for walleye and sauger from Sipiwesk Lake, 1987.
e = excluded from Walford and Brody analysis.

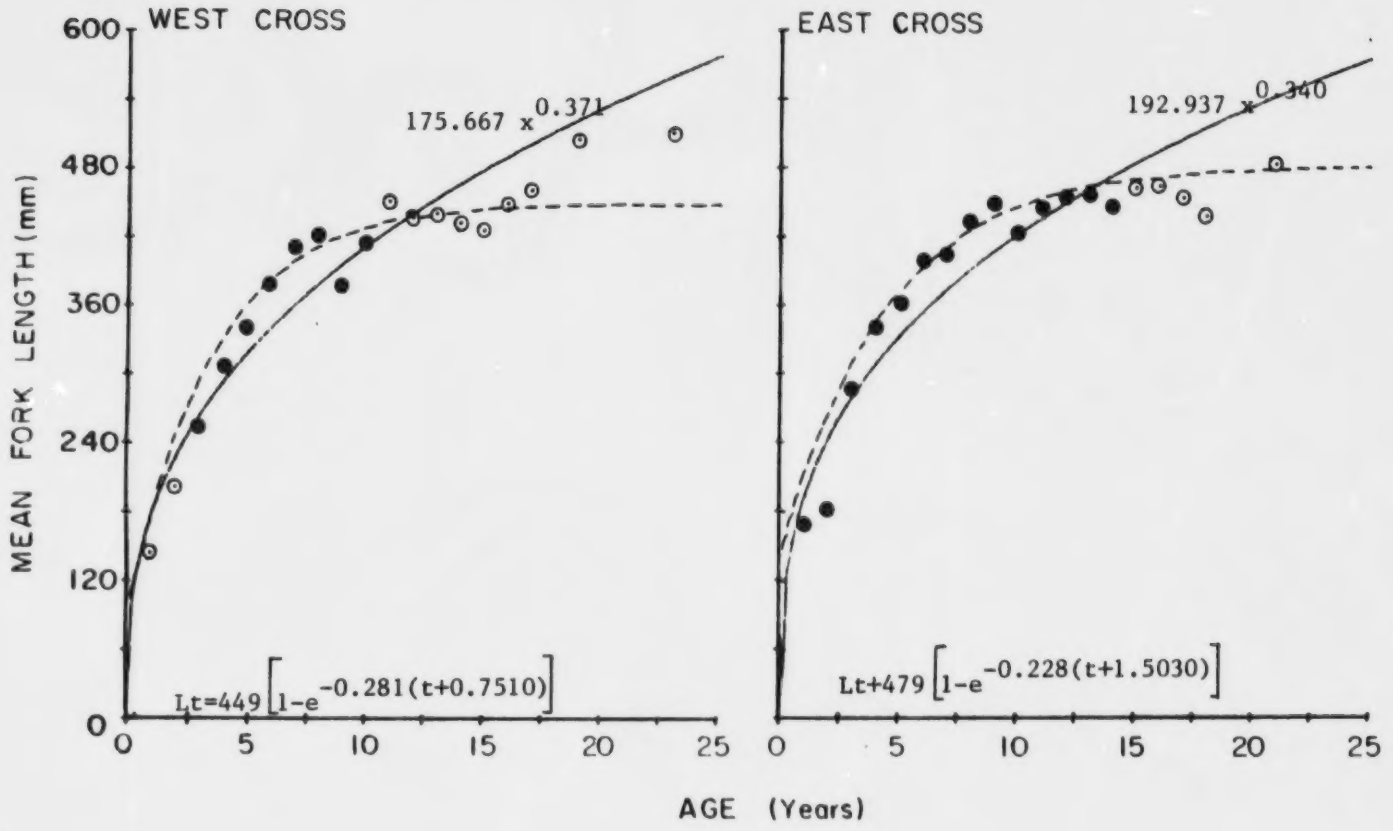

Fig. 33. Growth curves for walleye from West and East Cross lakes, 1987.
⊙ = excluded from Walford and Brody analysis.

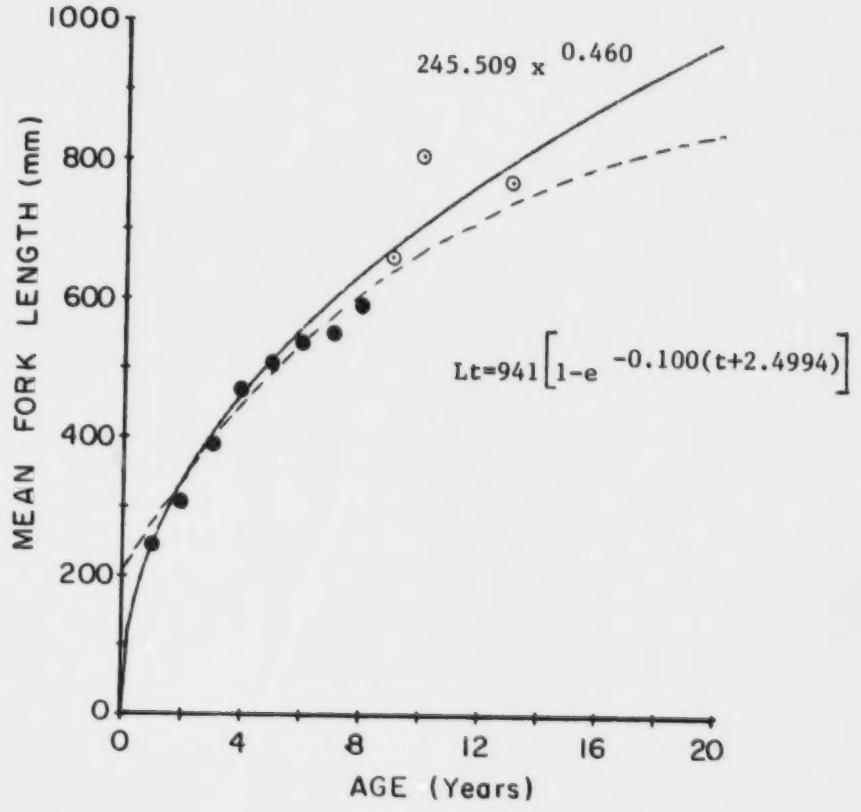

Fig. 34. Growth curves for northern pike from Sipiwesk Lake, 1987.
⊙ = excluded from Walford and Brody analysis.

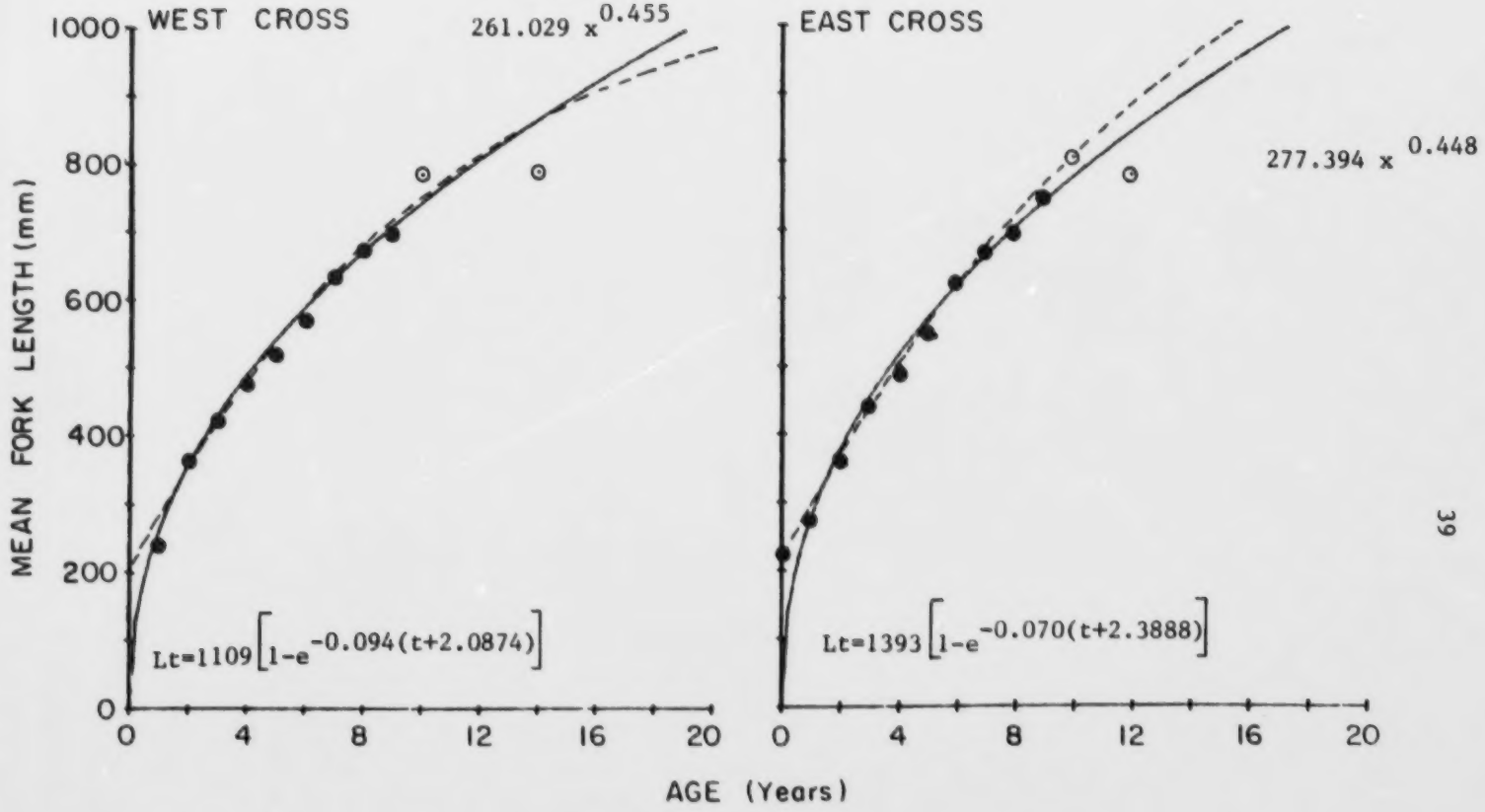

Fig. 35. Growth curves for northern pike from West and East Cross lakes, 1987.
⊙ = excluded from Walford and Brody analysis.

Table 1. Catch summary for experimental fishing sets from Sipiwesk Lake, 1987.

Set no.	Date of set	Whitefish	Cisco	Walleye	Sauger	Northern pike	White sucker	Longnose sucker	Shorthead redhorse sucker	Silver redhorse sucker	Yellow Perch	Mooneye	Goldeye	Burbot	Freshwater drum	Lake Chub	Total
1	June 15		3	4	22	1	28		2		1	16					79
2	June 15		3	26	2	9	14				2	92					148
3	June 15		1	7	8	9	32		4		3	57					121
4	June 16	3	2	2	7	1	42		1		10	10					78
5	June 16	1		15	7	5	41		2		5	32					108
6	June 17			23	1	9	10		7		2	7	1				60
7	June 17	4	1	8	11	7	48		3		1	3				1	87
8	June 18		11	16	15	3	50		3		6	64	2				170
9	June 18			6	4	4	21		2			2					39
10	June 18			14	7	1	40	1	1		1						65
11	June 19				8	3	20		1		1	3			4		40
12	June 19		11	13	18	5	22		3		9	87			1		169
13	June 19	4	15		26	7	9				9						70
14	June 20	2	1	3	4	31	13				2						56
15	June 20		4	1	24	3	23				6						61
16	June 20		30		29	4	16				4						83
17	June 20	4	8		10	8	3				6						39
18	June 22		10		13	1	6				7						37
19	June 22		9	1	14	2	5				4						35
20	June 22		8		8	1	3				1				2		23
21	June 29	2		14	3	3	9	1	2								34
22	June 29	3			1		7	3				1					15
23	June 29	1	1	2	4	2	7	1	1			2		1			22
24	June 29			23	4	2	2					1					32
25	June 30	1		6	4	10	6		1		4	1					33
26	June 30	2	1	2	4	1	6		1	1							18
27	June 30	2	10	8	4	4	15				1				1		45
28	June 30		19	13	3	6	13		2		2	1					59
29	July 1		9	4		7	9				14						43
30	July 1		9			5	24				21						59
31	July 1		30	2	1	19	2				5			3			62
32	July 1		48	10		9	18					2					87
33	July 2	8	73			3								3			87
34	July 2		3	3		8	14				37						65
35	July 2		21	4		21	4				3						53
36	July 2	2	51	6	1	11								14			85
37	July 3	1	9	16	1	5	15				1	19					67
38	July 3	4	16	16	3	7	16		2		12	4					80
39	July 3		8	22	5	3	30		1		1	12	1	1			84
40	July 3		2	16	2	4	5										29
Total		44	427	306	278	246	648	6	39	1	181	416	4	22	8	1	2627

Table 2. Catch summary for experimental fishing sets from West Cross Lake, 1987.

Set no.	Date of set	Whitefish	Cisco	Walleye	Sauger	Northern pike	White sucker	Longnose sucker	Shorthead redhorse sucker	Yellow perch	Mooneye	Goldeye	Burbot	Freshwater drum	Total
1	July 28	15	51	56	1	44	3		5	2		1			178
2	July 28	1	17	45		43	5		2	1					114
3	July 28	13	107	55	1	65	20		8	18					287
4 [1.]	July 28	23	148	30		100	7		6	8					322
5	July 30	8	83	52	1	46	7			4				1	202
6 [2.]	July 31			1	1	4				3					9
7	Aug. 11	1	5	4		6	6		1	1			1		25
8	Aug. 11		4			2	3				3				12
9	Aug. 12	2	25	15		26	14			7			1		90
10	Aug. 12		1	5		3	18			3	2	1	1		34
11	Aug. 13		5	6		4				2					17
12	Aug. 13		18	23		8	2		2						53
13	Aug. 14		29	8		2	4		2						45
14	Aug. 14		35	16		3	4		1						59
15	Aug. 15			1		6	3		1		1			1	13
16	Aug. 15		1	5	5	3	3	2		3					22
17	Aug. 16		8	30	1	14	14		4	7					78
Total		63	537	352	10	379	113	2	32	59	6	2	3	2	1560

1. fish were just identified and counted.

2. nets full of filamentous algae - fish just identified and counted.

Table 3. Catch summary for experimental fishing sets from East Cross Lake, 1987.

Set no.	Date of set	Whitefish	Cisco	Walleye	Northern Pike	White sucker	Shorthead redhorse sucker	Yellow perch	Goldeye	Freshwater drum	Total
1	Aug. 11		31	26	38	2		1			98
2	Aug. 11	6	25	21	38	2	2				94
3	Aug. 12	17	63	15	30	9	1				135
4	Aug. 12	31	41	14	40	3	2	1			132
5	Aug. 13	1	22	30	34	6	4		1		98
6	Aug. 13	5	22	16	28	3	1	1			76
7	Aug. 14	4	32	19	18	7	3	3			86
8	Aug. 14	5	37	41	28	6	4	2			123
9	Aug. 15	1	54	40	18	2	1	1			117
10	Aug. 15	3		35	21	3	6	3		1	72
11	Aug. 25	6	5	22	44	15	3				95
12	Aug. 25	7	45	78	33	17	1	4			185
13	Aug. 26	7	34	3	17	1		1			63
14	Aug. 26	3	24	14	23	10	1	3			78
Total		96	435	374	410	86	29	20	1	1	1452

Table 4. Catch per unit effort (CUE) and percent frequency of occurence for fish from Sipiwesk and Cross lakes, 1987.
Number in parentheses are the number of standard gangs set in each lake.

Species	CUE (number/gang/day)			CUE (kg/gang/day)			% frequency of occurence		
	Sipiwesk (40)	W. Cross (17)	E. Cross (14)	Sipiwesk	W. Cross (15)[1]	E. Cross	Sipiwesk	W. Cross	E. Cross
Whitefish	1.1	3.7	6.8	1.8	3.1	7.1	1.7	4.0	6.6
Cisco	10.7	31.6	31.1	3.2	7.0	9.1	16.3	34.4	30.0
Walleye	7.6	20.7	26.7	3.7	18.8	24.0	11.6	22.6	25.8
Sauger	7.0	0.6		1.4	0.2		10.6	0.6	
Northern pike	6.2	22.3	29.3	6.0	19.7	44.4	9.4	24.3	28.2
White sucker	16.2	6.6	6.1	14.7	8.8	8.8	24.7	7.2	5.9
Longnose sucker	0.2	0.1		0.1	0.1		0.2	0.1	
Shorthead redhorse	1.0	1.9	2.1	1.0	1.5	2.1	1.5	2.1	2.0
Silver redhorse	0.02			0.1			0.04		
Yellow perch	4.5	3.5	1.4	0.3	0.4	0.3	6.9	3.8	1.4
Hooneye	10.4	0.4		1.6	0.1		15.8	0.4	
Goldeye	0.1	0.1	0.07	0.05	0.1	0.04	0.2	0.1	<1
Burbot	0.6	0.2		1.0	0.2		0.8	0.2	
Freshwater drum	0.2	0.1	0.07	0.3	0.3	0.1	0.3	0.1	<1
Lake chub	0.02			<0.01			0.04		
Total	65.7	91.8	103.7	35.4	60.5	95.5	100	100	100

1. Based on 15 gangs instead of 17 since gangs 4 and 6 were counted only.

Table 5. Sum weights (kg) for fish caught in 40 experimental fishing sets in Sipiwesk Lake, 1987.

Species	Parameter	Mesh size (inches)						
		1.5	2.0	3.0	3.75	4.25	5.0	Total
Whitefish	N	1		4	7	14	18	44
	$\sum$ weights	0.03		5.15	7.50	29.34	29.48	71.50
Cisco	N	77	165	88	52	38	7	427
	$\sum$ weights	7.12	27.37	35.68	27.53	24.44	6.18	128.31
Walleye	N	27	92	119	51	11	5	306
	$\sum$ weights	11.76	28.79	58.32	33.56	10.03	5.90	149.17
Sauger	N	62	167	33	4	6	6	278
	$\sum$ weights	8.73	33.03	11.53	1.19	1.03	1.00	56.50
Northern pike	N	39	54	107	36	6	4	246
	$\sum$ weights	20.22	32.00	117.59	54.87	12.68	3.98	241.34
White sucker	N	19	60	155	198	149	67	648
	$\sum$ weights	1.34	18.27	114.04	183.72	170.05	100.43	587.83
Longnose sucker	N			1	4	1		6
	$\sum$ weights			1.01	3.16	0.82		4.99
Shorthead redhorse sucker	N	3	3	10	11	8	4	39
	$\sum$ weights	1.49	1.67	10.38	9.54	9.23	7.11	39.41
Silver redhorse sucker	N						1	1
	$\sum$ weights						2.62	2.62
Mooneye	N	74	219	93	13	10	7	416
	$\sum$ weights	7.24	26.48	24.00	3.50	2.35	1.79	65.36
Goldeye	N		1	1		1	1	4
	$\sum$ weights		0.16	0.49		0.60	0.57	1.83
Yellow perch	N	119	61	1				181
	$\sum$ weights	5.80	5.54	0.24				11.58
Burbot	N	1	1		1	4	15	22
	$\sum$ weights	0.09	0.21		1.18	6.66	33.65	41.79
Freshwater drum	N			1		2	5	8
	$\sum$ weights			2.54		3.26	7.34	13.13
Lake chub	N	1						1
	$\sum$ weights	0.07						0.07
Total	N	423	823	613	377	250	140	2627
	$\sum$ weights	63.88	173.52	380.98	325.75	270.48	200.02	1415.42

Table 6. Sum weights (kg) for fish caught in 17 experimental fishing sets in West Cross Lake, 1987.

Species	Parameter *	Mesh size (inches) 1.5	2.0	3.0	3.75	4.25	5.0	5.25	Total
Whitefish	N	5	8	5	5	5	5	7	40
	∑weights	0.30	4.72	6.91	6.98	7.60	6.98	13.48	46.97
Cisco	N	235	49	39	22	15	11	18	389
	∑weights	12.59	13.81	21.84	15.45	12.32	11.48	18.29	105.67
Walleye	N	27	28	82	105	69	7	3	321
	∑weights	15.47	17.49	64.31	96.99	73.91	9.38	4.88	282.44
Sauger	N	4	1	4					9
	∑weights	1.51	0.57	1.22					3.30
Northern pike	N	55	73	104	26	11	4	2	275
	∑weights	50.57	57.45	104.24	42.19	23.84	8.69	8.47	295.45
White sucker	N		1	11	38	29	15	12	106
	∑weights		1.38	6.59	39.87	38.41	23.95	21.89	132.09
Longnose sucker	N			1	1				2
	∑weights			0.40	1.10				1.50
Shorthead redhorse sucker	N	4	2	6	5	7	1	1	26
	∑weights	3.71	1.89	4.09	4.28	5.75	1.18	1.11	22.01
Mooneye	N	1	1	4					6
	∑weights	0.28	0.14	1.27					1.69
Goldeye	N	1				1			2
	∑weights	0.54				0.50			1.04
Yellow perch	N	18	22	5	3				48
	∑weights	1.05	3.12	1.25	1.32				6.74
Burbot	N				1	1	1		3
	∑weights				0.71	1.72	1.10		3.53
Freshwater drum	N						1	1	2
	∑weights						2.14	2.28	4.42
Total	N	350	185	261	206	138	45	44	1229
	∑weights	86.02	100.56	212.11	208.90	164.05	64.90	70.40	906.84

* N = Number of fish that sum weights are based on. Species from gang 4 and 6 were counted only. Check mesh size effects tables (8 - 26) for actual number of fish caught.

Table 7. Sum weights (kg) for fish caught in 14 experimental sets in East Cross Lake, 1987.

Species	Parameter	Mesh size (inches)							
		1.5	2.0	3.0	3.75	4.25	5.0	5.25	Total
Whitefish	N	12	22	10	8	8	19	17	96
	weights	1.93	2.16	14.54	13.01	10.99	30.12	26.68	99.43
Cisco	N	219	97	28	27	28	19	17	435
	$\sum$weights	14.67	16.94	16.64	19.27	22.31	17.96	19.40	127.19
Walleye	N	34	40	82	102	83	19	14	374
	$\sum$weights	18.00	30.39	61.36	90.48	89.78	27.23	19.19	336.43
Northern pike	N	62	95	116	66	43	18	10	410
	$\sum$weights	91.15	124.88	138.77	109.88	91.34	39.07	26.06	621.15
White sucker	N			8	23	25	19	11	86
	$\sum$weights			9.56	25.98	34.83	31.97	20.72	123.06
Shorthead redhorse sucker	N	1	8	5	5	6	1	3	29
	$\sum$weights	0.76	7.42	4.91	4.97	6.41	1.08	4.02	29.57
Goldeye	N				1				1
	$\sum$weights				0.52				0.52
Yellow perch	N	7	6	7					20
	$\sum$weights	0.49	0.97	2.18					3.64
Freshwater drum	N						1		1
	$\sum$weights						1.49		1.49
Total	N	335	268	256	232	193	96	72	1452
	$\sum$weights	127.00	182.76	247.96	264.11	255.66	148.92	116.07	1342.48

Table 8. Mesh size effects on whitefish catches from Sipiwesk Lake, 1987.

	Mesh size (inches)						
	1.50	2.00	3.00	3.75	4.25	5.00	Total
Number caught	1		4	7	14	18	44
CUE (No/100 yds/day)	0.10		0.40	0.70	1.40	1.80	0.73
CUE (Kg/100 yds/day)	0.00		0.52	0.75	2.93	2.95	1.19
Mean Length(mm)	140 ± -		410 ± 78.41	383 ± 67.34	473 ± 53.81	441 ± 52.71	432 ± 77.72
Mean Weight(g)	28 ± -		1289 ± 645.11	1071 ± 724.62	2096 ± 759.86	1638 ± 637.46	1625 ± 793.38
Number Mature			4	6	13	16	39
Number Immature	1			1	1	2	5
% Mature			100	85.7	92.9	88.9	88.6
Mean age (Years)	2.0		7.0	7.6	11.0	10.3	9.6
Age(years)	Frequency (%)						
2	100.0						2.3
4				14.3			2.3
5			25.0			5.6	4.5
6				57.1	7.1	16.7	18.2
7			25.0		7.1	5.6	6.8
8			50.0		21.4	16.7	18.2
9				14.3	14.3	11.1	11.4
10					14.3	5.6	6.8
11					7.1	5.6	4.5
13						11.1	4.5
14					14.3		4.5
15						16.7	6.8
16				14.3			2.3
20					14.3		4.5
22						5.6	2.3

Total effort for each mesh size was 1000 yards of net.
± = standard deviation

Table 9. Mesh size effects on whitefish catches from West Cross Lake, 1987.

	Mesh size (inches)							
	1.50	2.00	3.00	3.75	4.25	5.00	5.25	Total
Number caught [1.]	9	11	5	6	11	8	13	63
CUE (No/100 yds/day)	2.12	2.59	1.18	1.41	2.59	1.88	3.06	2.12
Number sampled [2.]	5	8	5	5	5	5	7	40
CUE (Kg/100 yds/day) [3.]	0.08	1.26	1.84	1.86	2.03	1.86	3.59	1.79
Mean Length(mm)	165 ± 16.84	268 ± 126.18	403 ± 115.50	425 ± 18.84	436 ± 65.91	423 ± 34.68	463 ± 50.36	366 ± 125.51
Mean Weight(g)	60 ± 24.21	590 ± 730.60	1382 ±1075.00	1396 ± 223.45	1520 ± 753.36	1396 ± 421.58	1926 ± 778.16	1174 ± 867.83
Number Mature		2	3	4	5	4	7	25
Number Immature	5	6	2	1		1		15
% Mature		25.0	60	80.0	100.0	80.0	100.0	62.5
Mean age (Years)	1.0	2.3	6.4	4.2	7.0	4.4	8.9	4.9
Age(years)	Frequency (%)							
1	100.0	50.0						22.5
2		12.5	20.0					5.0
3			20.0					2.5
4		37.5	20.0	80.0	60.0	80.0	28.6	42.5
5				20.0	20.0			5.0
6						20.0		2.5
7							14.3	2.5
8			20.0				28.6	7.5
15			20.0				14.3	5.0
16							14.3	2.5
18					20.0			2.5

Total effort for each mesh size was 425 yards of net.
± = standard deviation
1. 23 whitefish from gang 4 were counted only.
2. Rest of table calculations based on number sampled.
3. Based on 15 gangs(total mesh effort of 375 yards of net)since fish from gang 4 and 6 were counted only.
Number with unknown sex = 10

Table 10. Mesh size effects on whitefish catches from East Cross Lake, 1987.

	Mesh size (inches)							
	1.50	2.00	3.00	3.75	4.25	5.00	5.25	Total
Number caught	12	22	10	8	8	19	17	96
CUE (No/100 yds/day)	3.43	6.29	2.86	2.29	2.29	5.43	4.86	3.92
CUE (Kg/100 yds/day)	0.55	0.62	4.15	3.72	3.14	8.61	7.62	4.06
Mean Length(mm)	200 ± 65.51	187 ± 10.22	387 ± 137.19	437 ± 55.76	412 ± 60.05	441 ± 39.19	440 ± 38.75	344 ± 128.53
Mean Weight(g)	161 ± 276.89	98 ± 16.98	1454 ±1159.08	1626 ± 770.97	1374 ± 738.28	1585 ± 558.68	1569 ± 461.77	1036 ± 885.53
Number Mature	1	2	6	4	7	14	13	47
Number Immature	11	20	4	4	1	5	4	49
% Mature	8.3	9.1	60	50.0	87.5	73.7	76.5	49.0
Mean age (Years)	1.3	1.0	5.2	5.1	4.1	5.1	5.0	3.6
Age(years)	Frequency (%)							
1	91.7	100.0	20.0					36.5
2			10.0		12.5			2.1
3			10.0	12.5	12.5		5.9	4.2
4	8.3		10.0	62.5	62.5	57.9	47.1	32.3
5			20.0			10.5	23.5	8.3
6			20.0			15.8	5.9	6.3
7						5.3		1.0
8					12.5		17.6	4.2
9				25.0		10.5		4.2
19			10.0					1.0

Total effort for each mesh size was 350 yards of net.
± = standard deviation

Table 11. Mesh size effects on cisco catches from Sipiwesk Lake, 1987.

	Mesh size (inches)						
	1.50	2.00	3.00	3.75	4.25	5.00	Total
Number caught	77	165	88	52	38	7	427
CUE (No/100 yds/day)	7.70	16.50	8.80	5.20	3.80	0.70	7.12
CUE (Kg/100 yds/day)	0.71	2.74	3.57	2.75	2.44	0.62	2.14
Mean Length(mm)	173 ± 44.86	219 ± 40.53	292 ± 40.65	318 ± 25.16	332 ± 31.25	365 ± 18.02	250 ± 68.50
Mean Weight(g)	92 ± 143.11	166 ± 139.58	405 ± 203.64	529 ± 162.74	643 ± 198.63	883 ± 102.54	300 ± 256.74
Number Mature	8	53	67	43	34	7	212
Number Immature	66	112	21	8	4		211
% Mature	10.8	32.1	76.13	84.3	89.5	100.0	50.1
Mean age (Years)	2.5	3.5	6.4	7.3	8.4	8.7	4.9
Age(years)	Frequency (%)						
0	2.6						0.5
2	74.0	11.5					17.8
3	15.6	67.3	10.2	1.9	2.6		31.4
4		4.8	13.6				4.7
5		5.5	20.5	9.6	2.6	14.3	8.0
6	2.6	4.2	17.0	36.5	21.1		11.9
7	3.9	3.0	3.4	15.4	15.8	14.3	6.1
8	1.3	1.2	9.1	9.6		14.3	4.0
9		1.8	17.0	13.5	21.1		7.7
10		0.6	6.8	7.7	18.4	42.9	4.9
11			1.1	1.9	13.2	14.3	1.9
12				1.9	2.6		0.5
13			1.1	1.9	2.6		0.7

Total effort for each mesh size was 1000 yards of net.
± = standard deviation
Number with unknown sex = 23
Number with unknown maturity= 4

Table 12. Mesh size effects on cisco catches from West Cross Lake, 1987.

	Mesh size (inches)							
	1.50	2.00	3.00	3.75	4.25	5.00	5.25	Total
Number caught [1]	272	55	57	57	34	22	40	537
CUE (No/100 yds/day)	64.00	12.94	13.41	13.41	8.00	5.18	9.41	18.05
CUE (Kg/100 yds/day) [2]	3.36 (235)	3.68 (49)	5.82 (39)	4.12 (22)	3.28 (15)	3.06 (11)	4.88 (18)	4.03 (389)
Number sampled [3]	215	49	39	22	15	11	18	369
Mean Length(mm)	149 ± 22.55	220 ± 84.91	304 ± 48.90	332 ± 32.51	349 ± 34.69	371 ± 41.95	366 ± 31.66	211 ± 92.03
Mean Weight(g)	55 ± 73.97	282 ± 408.67	560 ± 316.24	702 ± 270.26	821 ± 376.56	1044 ± 373.82	1016 ± 237.09	284 ± 394.61
Number Mature	2	16	32	20	12	11	18	111
Number Immature	126	18	4	1				149
% Mature	1.6	47.1	88.88	95.2	100.0	100.0	100.0	42.7
Mean age (Years)	0.3	1.5	4.0	5.6	4.7	4.5	4.7	1.7
Age(years)	Frequency (%)							
1	60.0	34.7	2.6					39.8
2	1.9	10.2	2.6					2.7
3		12.2	35.9	22.7		9.1	16.7	7.9
4	0.5	6.1	33.3	18.2	26.7	54.5	55.6	11.1
5		6.1	12.8	13.6	20.0	9.1	5.6	4.3
6	0.5	2.0	5.1	13.6		27.3	11.1	3.3
7			5.1	4.5				0.8
8		2.0	2.6	9.1	20.0		5.6	2.2
9				18.2	6.7			1.4
10					6.7		5.6	0.5

Total effort for each mesh size was 425 yards of net.
± = standard deviation
1. 148 cisco from gangs 4 and 6 were counted only; 20 cisco from gangs 1 and 3 were counted and bulk weighed only.
2. Based on number of fish in parentheses and 15 gangs(total mesh effort of 375 yds of net) since fish from gangs 4 and 6 were counted only.
3. Rest of table calculations based on number sampled.
Number with unknown sex = 165
Number with unknown maturity= 109
Number with unknown age = 96

Table 13. Mesh size effects on cisco catches from East Cross Lake, 1987.

	Mesh size (inches)							
	1.50	2.00	3.00	3.75	4.25	5.00	5.25	Total
Number caught [1]	219	97	28	27	28	19	17	435
CUE (No/100 yds/day)	62.57	27.71	8.00	7.71	8.00	5.43	4.86	17.76
Number sampled [2]	170	72	28	27	28	19	17	361
CUE (Kg/100 yds/day)	4.19	4.84	4.75	5.51	6.37	5.13	5.54	5.19
Mean Length(mm)	156 ± 31.54	208 ± 65.94	303 ± 51.44	329 ± 33.02	342 ± 27.91	357 ± 20.34	373 ± 26.01	226 ± 91.33
Mean Weight(g)	70 ± 133.07	213 ± 283.31	594 ± 319.82	714 ± 244.10	797 ± 186.93	945 ± 203.86	1141 ± 270.41	340 ± 403.83
Number Mature	4	27	27	26	27	19	17	147
Number Immature	163	45	1	1				210
% Mature	2.4	37.5	96.42	96.3	100.0	100.0	100.0	41.2
Mean age (Years)	1.1	2.0	3.6	4.0	4.4	5.4	5.6	2.4
Age(years)	Frequency (%)							
1	92.9	48.6						53.5
2	2.9	31.9	28.6	3.7				10.2
3	0.6	4.2	17.9	18.5	3.6			4.2
4	0.6	8.3	28.6	55.6	50.0	21.1	17.6	14.1
5		2.8	14.3	18.5	35.7	36.8	47.1	10.0
6	1.2	2.8	10.7	3.7	3.6	26.3	11.8	4.4
7						15.8	5.9	1.1
8		1.4			3.6		17.6	1.4

Total effort for each mesh size was 350 yards of net.
± = standard deviation
1. 74 cisco from gangs 12-24 were counted and bulk weighed only.
2. Rest of table calculations based on number sampled.
Number with unknown sex = 4
Number with unknown maturity= 4
Number with unknown age = 4

Table 14. Mesh size effects on walleye catches from Sipiwesk Lake, 1987.

	Mesh size (inches)						
	1.50	2.00	3.00	3.75	4.25	5.00	Total
Number caught	27	92	119	51	12	5	306
CUE (No/100 yds/day)	2.70	9.20	11.90	5.10	1.20	0.50	5.10
CUE (Kg/100 yds/day)	1.18	2.88	5.83	3.36	1.08	0.59	2.49
Mean Length(mm)	329 ± 71.71	298 ± 58.84	354 ± 29.58	388 ± 22.22	427 ± 32.67	435 ± 105.16	345 ± 59.15
Mean Weight(g)	435 ± 295.37	313 ± 178.28	490 ± 117.96	658 ± 144.23	903 ± 192.56	1179 ± 703.17	487 ± 249.95
Number Mature	13	23	75	36	12	4	163
Number Immature	14	69	44	15		1	143
% Mature	48.1	25.0	63.02	70.6	100.0	80.0	53.3
Mean age (Years)	7.7	6.3	9.2	11.7	13.8	15.8	8.9
Age(years)	Frequency (%)						
3	7.4	8.7					3.3
4	14.8	39.1	2.5			20.0	14.4
5	11.1	1.1	1.7				2.0
6	22.2	25.0	24.4	7.8	8.3		20.6
7	3.7	2.2	5.0	2.0			3.3
8	3.7	4.3	22.7	17.6			13.4
9	3.7	2.2	5.0				2.9
10	7.4	3.3	7.6	9.8			6.2
11	11.1	3.3	5.0	11.8			5.9
12	7.4	2.2	9.2	11.8	16.7		7.5
13			3.4	5.9	16.7		2.9
14		7.6	8.4	17.6	33.3	40.0	10.5
15			1.7	2.0	8.3		1.3
16				3.9			0.7
17	7.4	1.1	0.8	2.0	8.3		2.0
18			0.8	3.9			1.0
19				2.0			0.3
20			0.8				0.3
21					8.3	20.0	0.7
23			0.8				0.3
24				2.0			0.3
26						20.0	0.3

Total effort for each mesh was 1000 yards of net.
± = standard deviation
Number with unknown sex = 3

Table 15. Mesh size effects on walleye from West Cross Lake, 1987.

	Mesh size (inches)							
	150	200	300	375	425	500	525	Total
Number caught [1.]	29	32	89	114	77	8	3	352
CUE (No/100 yds/day)	6.82	7.53	20.94	26.82	18.12	1.88	0.71	11.83
Number sampled [2.]	27	28	82	105	69	7	3	321
CUE (Kg/100 yds/day) [3.]	4.12	4.66	17.15	25.86	19.71	2.50	1.30	10.76
Mean Length(mm)	352 ± 77.72	363 ± 75.44	401 ± 49.25	423 ± 31.74	441 ± 28.48	471 ± 36.05	500 ± 18.72	412 ± 55.04
Mean Weight(g)	573 ± 285.74	625 ± 355.60	784 ± 306.28	924 ± 265.03	1071 ± 186.92	1340 ± 326.39	1627 ± 344.29	880 ± 329.26
Number Mature	12	14	52	82	66	7	3	236
Number Immature	15	14	28	17	3			77
% Mature	44.4	50.0	65	82.8	95.7	100.0	100.0	75.4
Mean age (Years)	5.9	6.3	7.8	9.1	10.3	8.4	15.0	8.6
Age(years)	Frequency (%)							
1	3.7							0.3
2	7.4							0.6
3	3.7	14.3						1.6
4	7.4	17.9	9.8		1.4	14.3		5.3
5	7.4		3.7	1.9	1.4			2.5
6	37.0	25.0	30.5	22.9	5.8	14.3		22.1
7	3.7	7.1	4.9	4.8	2.9			4.4
8	25.9	21.4	31.7	37.1	39.1	42.9		33.6
9		7.1	2.4	1.9				1.9
10		3.6	1.2	1.0	2.9			1.6
11	3.7	3.6	3.7	7.6	11.6	14.3	33.3	7.2
12			3.7	3.8	7.2			3.7
13				7.6	7.2			4.0
14			2.4	4.8	7.2	14.3		4.0
15			2.4	2.9	4.3			2.5
16			1.2	1.0	1.4			0.9
17			2.4	1.9	5.8		66.7	3.1
19					1.4			0.3
23				1.0				0.3

Total effort for each mesh size was 425 yards of net.
± = standard deviation
1. 31 walleye from gangs 4 and 6 were counted only.
2. Rest of table calculations based on number sampled except excluded unknowns.
3. Based on 15 gangs(total mesh effort of 375 yds of net)since fish from gangs 4 and 6 were counted only.
Number with unknown sex = 9
Number with unknown maturity= 8

Table 16. Mesh size effects on walleye catches from East Cross Lake, 1987.

	Mesh size (inches)							
	1.50	2.00	3.00	3.75	4.25	5.00	5.25	Total
Number caught	34	40	82	102	83	19	14	374
CUE (No/100 yds/day)	9.71	11.43	23.43	29.14	23.71	5.43	4.00	15.26
CUE (Kg/100 yds/day)	5.14	8.68	17.53	25.85	25.65	7.78	5.48	13.73
Mean Length(mm)	322 ± 104.34	384 ± 63.33	386 ± 45.13	410 ± 34.69	438 ± 27.33	477 ± 25.88	468 ± 20.46	406 ± 61.45
Mean Weight(g)	529 ± 401.82	760 ± 367.46	748 ± 275.40	887 ± 227.28	1082 ± 191.86	1433 ± 216.59	1370 ± 217.59	900 ± 347.46
Number Mature	14	26	47	78	78	19	13	275
Number Immature	20	14	35	24	5		1	99
% Mature	41.2	65.0	57.31	76.5	94.0	100.0	92.9	73.5
Mean age (Years)	4.6	7.4	6.3	7.8	8.5	12.6	11.4	7.7
Age(years)	Frequency (%)							
1	23.5	2.5						2.4
2	5.9							0.5
3	2.9	5.0	1.2					1.1
4	17.6	17.5	32.9	5.9				12.3
5	14.7	20.0	17.1	8.8	2.4			10.2
6	23.5	10.0	22.0	45.1	38.6		7.1	29.1
7	2.9	7.5	2.4	7.8	6.0			5.1
8	2.9	10.0	9.8	8.8	24.1	10.5	14.3	12.3
9		2.5		1.0	2.4	5.3	7.1	1.6
10			2.4		1.2			0.8
11		5.0	3.7	5.9	2.4		7.1	3.7
12		2.5	2.4	2.0	6.0	15.8	28.6	4.5
13	2.9	7.5	1.2	5.9	8.4	42.1	21.4	7.8
14		2.5	2.4	3.9	4.8	10.5	7.1	3.7
15		2.5	1.2		1.2	5.3		1.1
16					1.2	10.5		0.8
17	2.9	5.0		2.9	1.2		7.1	2.1
18			1.2	1.0				0.5
21				1.0				0.3

Total effort for each mesh size was 350 yards of net.
± = standard deviation

Table 17. Mesh size effects on sauger catches from Sipiwesk Lake, 1987.

	Mesh size (inches)						
	150	200	300	375	425	500	Total
Number caught	62	167	33	4	6	6	278
CUE (No/100 yds/day)	6.20	16.70	3.30	0.40	0.60	0.60	4.63
CUE (Kg/100 yds/day)	0.87	3.30	1.15	0.12	0.10	0.10	0.94
Mean Length(mm)	243 ± 45.23	274 ± 38.27	342 ± 26.39	313 ± 68.93	253 ± 58.67	262 ± 38.77	275 ± 48.47
Mean Weight(g)	141 ± 81.55	198 ± 81.93	349 ± 64.93	296 ± 163.37	171 ± 112.20	167 ± 66.29	203 ± 100.91
Number Mature	11	53	29	3	1	2	99
Number Immature	51	114	4	1	5	4	179
% Mature	17.7	31.7	87.87	75.0	16.7	33.3	35.6
Mean age (Years)	4.8	6.3	10.5	9.3	5.8	5.8	6.5
Age(years)	Frequency (%)						
2	1.6				16.7		0.7
3	24.2	5.4					8.6
4	33.9	17.4		25.0		33.3	19.1
5	14.5	16.2			33.3	16.7	14.0
6	17.7	31.7	12.1		16.7	16.7	25.2
7		6.6	3.0		16.7		4.7
8		4.8	9.1			33.3	4.7
9		3.0	9.1				2.9
10	3.2	7.2	15.2	25.0	16.7		7.6
11	3.2	4.2	21.2	25.0			6.1
12		2.4	6.1	25.0			2.5
13			9.1				1.1
14	1.6	1.2	9.1				2.2
15			3.0				0.4
16			3.0				0.4

Total effort for each mesh size was 1000 yards of net.
± = standard deviation
Number with unknown sex = 11

Table 18. Mesh size effects on sauger catches from West Cross Lake, 1987.

	Mesh size (inches)							
	150	200	300	375	425	500	525	Total
Number caught [1]	4	2	4					10
CUE (No/100 yds/day)	0.94	0.47	0.94					0.34
Number sampled [2]	4	1	4					9
CUE (Kg/100 yds/day) [3]	0.40	0.15	0.32					0.13
Mean Length(mm)	323 ± 83.45	390 ± -	311 ± 48.95					325 ± 64.34
Mean Weight(g)	377 ± 279.99	570 ± -	305 + 148.37					367 ± 211.57
Number Mature	3	1	2					6
Number Immature	1		1					2
% Mature	75.0	100.0	66.66					75.0
Mean age (Years)	8.0	11.0	6.8					7.8
Age(years)	Frequency (%)							
4	25.0							11.1
5	25.0							11.1
6			50.0					22.2
7			25.0					11.1
8			25.0					11.1
10	25.0							11.1
11		100.0						11.1
13	25.0							11.1

Total effort for each mesh size was 425 yards of net.
± = standard deviation
1. One sauger from gang 6 was counted only.
2. Rest of table calculations based on number sampled except those excluded unknowns.
3. Based on 15 gangs(total mesh effort of 375 yds of net) since fish from gangs 4 and 6 were counted only.
Number with unknown sex = 1
Number with unknown maturity= 1

Table 19. Mesh size effects on northern pike catches from Sipiwesk Lake, 1987.

	Mesh size (inches)						
	1.50	2.00	3.00	3.75	4.25	5.00	Total
Number caught	39	54	107	36	6	4	246
CUE (No/100 yds/day)	3.90	5.40	10.70	3.60	0.60	0.40	4.10
CUE (Kg/100 yds/day)	2.02	3.20	11.66	5.49	1.26	0.40	4.00
Mean Length(mm)	385 ± 130.05	426 ± 92.50	537 ± 54.65	581 ± 81.37	597 ± 174.81	499 ± 193.04	496 ± 113.58
Mean Weight(g)	518 ± 469.75	593 ± 349.25	1090 ± 456.43	1524 ± 914.96	2105 ±1535.17	994 ± 562.57	977 ± 684.87
Number Mature	10	21	68	27	5	2	133
Number Immature	29	33	39	9	1	2	113
% Mature	25.6	38.9	63.55	75.0	83.3	50.0	54.1
Mean age (Years)	3.1	3.9	5.8	6.6	6.7	4.8	5.1
Age(years)	Frequency (%)						
1	23.1	5.6					4.9
2	23.1	18.5	0.9		16.7	25.0	8.9
3	17.9	24.1	4.7				10.2
4	15.4	16.7	13.1	8.3			13.0
5	5.1	14.8	27.1	13.9		25.0	18.3
6	10.3	11.1	23.4	25.0	16.7	50.0	19.1
7	2.6	9.3	18.7	25.0	16.7		14.6
8			9.3	19.4	33.3		7.7
9	2.6		1.9	2.8	16.7		2.0
10				5.6			0.8
13			0.9				0.4

Total effort for each mesh size was 1000 yards of net.
± = standard deviation
Number with unknown sex = 3

Table 20. Mesh size effects on northern pike catches from West Cross Lake, 1987.

	Mesh size (inches)							
	150	200	300	375	425	500	525	Total
Number caught [1.]	84	110	137	28	12	6	2	379
CUE (No/100 yds/day)	19.77	25.88	32.24	6.59	2.83	1.41	0.47	12.74
Number sampled [2.]	55	73	104	26	11	4	2	275
CUE (Kg/100 yds/day) [3.]	13.49	15.32	27.80	11.25	6.36	2.32	2.26	11.26
Mean Length(mm)	476 ± 130.84	472 ± 85.34	515 ± 59.80	605 ± 81.89	669 ± 96.63	622 ± 164.76	814 ± 79.20	514 ± 106.10
Mean Weight(g)	920 ± 792.53	787 ± 424.81	1002 ± 428.54	1623 ± 733.81	2167 ± 922.56	2173 ±1315.08	4235 ± 304.06	1074 ± 731.78
Number Mature	24	38	74	22	10	4	2	174
Number Immature	31	35	27	3	1			97
% Mature	43.6	52.1	73.26	88.0	90.9	100.0	100.0	64.2
Mean age (Years)	4.0	4.0	4.7	6.0	7.0	5.5	10.0	4.6
Age(years)	Frequency (%)							
1	9.1	1.4						2.2
2	10.9	9.6	1.0					5.1
3	12.7	20.5	9.6	3.8		25.0		12.4
4	27.3	34.2	47.1	11.5	18.2			34.2
5	23.6	21.9	20.2	34.6		25.0		21.8
6	5.5	5.5	12.5	23.1	18.2	25.0		10.5
7	3.6	1.4	6.7	15.4	18.2			5.8
8	5.5	2.7	1.9	3.8	27.3	25.0		4.4
9		1.4	1.0	3.8	9.1			1.5
10					9.1		100.0	1.1
14				3.8				0.4

Total effort for each mesh size was 425 yards of net.
± = standard deviation
1. 104 northern pike from gangs 4 and 6 were counted only.
2. Rest of table calculations based on number sampled.
3. Based on 15 gangs(total mesh effort of 375 yds of net) since fish from gangs 4 and 6 were counted only.
Number with unknown sex = 5
Number with unknown maturity= 4
Number with unknown age = 2

Table 21. Mesh size effects on northern pike catches from East Cross Lake, 1987.

	Mesh size (inches)							
	1.50	2.00	3.00	3.75	4.25	5.00	5.25	Total
Number caught	62	95	116	66	43	18	10	410
CUE (No/100 yds/day)	17.71	27.14	33.14	18.86	12.29	5.14	2.86	16.73
CUE (Kg/100 yds/day)	26.04	35.68	39.65	31.39	26.10	11.16	7.45	25.35
Mean Length(mm)	569 ± 110.24	537 ± 129.12	531 ± 85.30	596 ± 100.13	646 ± 83.84	645 ± 113.18	710 ± 80.15	570 ± 113.11
Mean Weight(g)	1470 ± 830.05	1314 ± 999.96	1196 ± 684.78	1665 ± 950.99	2124 ± 963.98	2171 ±1102.24	2606 ±1054.35	1515 ± 952.70
Number Mature	21	36	68	27	24	10	3	189
Number Immature	41	59	48	39	19	8	7	221
% Mature	33.9	37.9	58.62	40.9	55.8	55.6	30.0	46.1
Mean age (Years)	5.1	4.6	4.7	5.6	6.4	5.8	7.6	5.2
Age(years)	Frequency (%)							
0		1.1						
1	1.6	1.1		1.5				0.2
2	3.2	6.3	2.6					0.7
3	8.1	22.1	15.5	1.5	4.7			2.7
4	21.0	14.7	36.2	21.2	4.7	22.2	10.0	11.5
5	27.4	25.3	22.4	28.8	14.0	27.8		22.0
6	19.4	13.7	10.3	19.7	27.9	16.7	20.0	23.7
7	12.9	11.6	10.3	15.2	25.6	16.7	30.0	16.3
8	6.5	3.2	0.9	7.6	16.3	11.1		14.1
9		1.1	1.7	3.0	4.7	5.6	30.0	5.4
10				1.5	2.3			2.7
12							10.0	0.5
								0.2

Total effort for each mesh size was 350 yards of net.
± = standard deviation

Table 22. Mesh size effects on white, longnose, shorthead redhorse, and silver redhorse sucker catches from Sipiwesk Lake, 1987.

Species		Mesh size (inches)						
		150	200	300	375	425	500	Total
White sucker	Number caught	19	59	155	198	149	67	648
	CUE (No/100 yds/day)	1.90	5.90	15.50	19.80	14.90	6.70	10.80
	CUE (Kg/100 yds/day)	0.13	1.67	11.40	18.37	17.01	10.04	9.80
	Mean Length(mm)	169 ± 18.40	254 ± 64.56	348 ± 46.36	377 ± 36.20	406 ± 30.71	441 ± 40.57	366 ± 70.97
	Mean Weight(g)	70 ± 27.34	284 ± 261.56	736 ± 277.11	928 ± 254.71	1141 ± 262.17	1499 ± 259.28	907 ± 423.55
Longnose sucker	Number caught			1	4	1		6
	CUE (No/100 yds/day)			0.10	0.40	0.10		0.10
	CUE (Kg/100 yds/day)			0.10	0.32	0.08		0.08
	Mean Length(mm)			411 ± -	378 ± 24.93	376 ± -		383 ± 23.61
	Mean Weight(g)			1010 ± -	790 ± 121.31	820 ± -		832 ± 128.87
Shorthead redhorse sucker	Number caught	3	3	10	11	8	4	39
	CUE (No/100 yds/day)	0.30	0.30	1.00	1.10	0.80	0.40	0.65
	CUE (Kg/100 yds/day)	0.15	0.17	1.04	0.95	0.92	0.71	0.66
	Mean Length(mm)	288 ± 131.16	329 ± 11.37	390 ± 76.24	372 ± 35.84	399 ± 54.96	468 ± 91.32	382 ± 75.12
	Mean Weight(g)	495 ± 420.08	558 ± 59.03	1038 ± 789.65	867 ± 295.05	1153 ± 612.46	1776 ± 964.67	1011 ± 657.19
Silver redhorse sucker	Number caught						1	1
	CUE (No/100 yds/day)						0.10	0.02
	CUE (Kg/100 yds/day)						0.26	0.04
	Mean Length(mm)						522 ± -	522 ± -
	Mean Weight(g)						2620 ± -	2620 ± -

Total effort for each mesh was 1000 yards of net.
± = standard deviation

Table 23. Mesh size effects on mooneye, goldeye, yellow perch, burbot, freshwater drum, and lake chub catches from Sipiwesk Lake, 1987.

Species		Mesh size (inches)						
		1.50	2.00	3.00	3.75	4.25	5.00	Total
Mooneye	Number caught	74	219	93	13	10	7	416
	CUE (No/100 yds/day)	7.40	21.90	9.30	1.30	1.00	0.70	6.93
	CUE (Kg/100 yds/day)	0.72	2.65	2.40	0.35	0.24	0.18	1.09
	Mean Length(mm)	190 ± 35.56	204 ± 33.54	265 ± 18.80	265 ± 39.02	257 ± 42.05	262 ± 17.84	219 ± 43.08
	Mean Weight(g)	98 ± 74.36	121 ± 69.62	258 ± 50.43	269 ± 97.94	235 ± 93.23	256 ± 64.00	157 ± 94.40
Goldeye	Number caught		1	1		1	1	4
	CUE (No/100 yds/day)		0.10	0.10		0.10	0.10	0.07
	CUE (Kg/100 yds/day)		0.02	0.05		0.06	0.06	0.03
	Mean Length(mm)		246 ± -	342 ± -		372 ± -	347 ± -	327 ± 55.41
	Mean Weight(g)		162 ± -	493 ± -		604 ± -	566 ± -	456 ± 201.50
Yellow perch	Number caught	119	61	1				181
	CUE (No/100 yds/day)	11.90	6.10	0.10				3.02
	CUE (Kg/100 yds/day)	0.58	0.55	0.02				0.19
	Mean Length(mm)	149 ± 14.65	184 ± 17.53	254 ± -				161 ± 23.60
	Mean Weight(g)	49 ± 15.46	91 ± 28.27	240 ± -				64 ± 31.49
Burbot	Number caught	1	1		1	4	15	22
	CUE (No/100 yds/day)	0.10	0.10		0.10	0.40	1.50	0.37
	CUE (Kg/100 yds/day)	0.01	0.02		0.12	0.67	3.37	0.70
	Mean Length(mm)	234 ± -	214 ± -		544 ± -	604 ± 76.03	674 ± 26.96	614 ± 136.46
	Mean Weight(g)	90 ± -	205 ± -		1180 ± -	1665 ± 417.97	2243 ± 282.94	1899 ± 700.39
Freshwater drum	Number caught			1		2	5	8
	CUE (No/100 yds/day)			0.10		0.20	0.50	0.13
	CUE (Kg/100 yds/day)			0.25		0.23	0.73	0.20
	Mean Length(mm)			492 ± -		464 ± 38.89	448 ± 18.87	458 ± 25.72
	Mean Weight(g)			2540 ± -		1628 ± 449.01	1467 ± 163.46	1641 ± 425.62
Lake chub	Number caught	1						1
	CUE (No/100 yds/day)	0.10						0.02
	CUE (Kg/100 yds/day)	0.01						0.001
	Mean Length(mm)	173 ± -						173 ± -
	Mean Weight(g)	67 ± -						67 ± -

Total effort for each mesh was 1000 yards of net.
± = standard deviation

Table 24. Mesh size effects on white, longnose, and shorthead redhorse sucker catches from West Cross Lake, 1987.

Species		Mesh size (inches)							
		1.50	2.00	3.00	3.75	4.25	5.00	5.25	Total
White sucker	Number caught		1	12	39	30	17	14	113
	CUE (No/100 yds/day)		0.24	2.82	9.18	7.06	4.00	3.29	3.80
	CUE (Kg/100 yds/day) *		0.32	1.55	9.38	9.04	5.64	5.15	5.18
	Mean Length(mm)		418 ± -	331 ± 20.70	398 ± 39.71	429 ± 31.17	460 ± 29.71	474 ± 30.51	417 ± 51.51
	Mean Weight(g)		1380 ± -	599 ± 116.75	1049 ± 303.71	1324 ± 291.83	1597 ± 232.68	1824 ± 304.56	1246 ± 434.68
Longnose sucker	Number caught			1	1				2
	CUE (No/100 yds/day)			0.24	0.24				0.07
	CUE (Kg/100 yds/day) *			0.11	0.29				0.06
	Mean Length(mm)			320 ± -	434 ± -				377 ± 80.61
	Mean Weight(g)			404 ± -	1100 ± -				752 ± 492.15
Shorthead redhorse sucker	Number caught	5	2	7	6	10	1	1	32
	CUE (No/100 yds/day)	1.18	0.47	1.65	1.41	2.35	0.24	0.24	1.07
	CUE (Kg/100 yds/day) *	0.99	0.50	1.09	1.14	1.53	0.31	0.30	0.84
	Mean Length(mm)	387 ± 29.97	391 ± 55.15	350 ± 11.93	376 ± 26.96	375 ± 38.33	418 ± -	390 ± -	374 ± 31.78
	Mean Weight(g)	928 ± 182.46	943 ± 392.44	682 ± 130.60	856 ± 187.30	822 ± 224.59	1180 ± -	1110 ± -	846 ± 216.82

Total effort for each mesh size was 425 yards of net.
± = standard deviation
* = Based on 15 gangs(total mesh effort of 375 yds of net) since fish from gangs 4 and 6 were counted only.

Table 25. Mesh size effects on mooneye, goldeye, yellow perch, burbot, and freshwater drum catches from West Cross Lake, 1987.

Species		Mesh size (inches) 150	200	300	375	425	500	525	Total
Mooneye	Number caught	1	1	4					6
	CUE (No/100 yds/day)	0.24	0.24	0.94					0.20
	CUE (Kg/100 yds/day) *	0.07	0.04	0.34					0.06
	Mean Length(mm)	274 ± -	224 ± -	287 ± 4.12					274 ± 25.20
	Mean Weight(g)	284 ± -	140 ± -	317 ± 15.78					282 ± 71.66
Goldeye	Number caught	1				1			2
	CUE (No/100 yds/day)	0.24				0.24			0.07
	CUE (Kg/100 yds/day) *	0.14				0.14			0.04
	Mean Length(mm)	340 ± -				336 ± -			338 ± 2.83
	Mean Weight(g)	500 ± -				538 ± -			519 ± 26.87
Yellow perch	Number caught	22	29	5	3				59
	CUE (No/100 yds/day)	5.18	6.82	1.18	0.71				1.98
	CUE (Kg/100 yds/day) *	0.25	0.74	0.29	0.30				0.23
	Mean Length(mm)	151 ± 24.17	203 ± 21.58	244 ± 32.54	328 ± 62.77				196 ± 53.14
	Mean Weight(g)	58 ± 33.93	142 ± 49.63	249 ± 89.88	441 ± 106.96				140 ± 110.84
Burbot	Number caught				1	1	1		3
	CUE (No/100 yds/day)				0.27	0.27	0.27		0.10
	CUE (Kg/100 yds/day) *				0.19	0.46	0.29		0.13
	Mean Length(mm)				460 ± -	616 ± -	558 ± -		545 ± 78.85
	Mean Weight(g)				710 ± -	1720 ± -	1100 ± -		1177 ± 509.35
Freshwater drum	Number caught						1	1	2
	CUE (No/100 yds/day)						0.27	0.27	0.07
	CUE (Kg/100 yds/day) *						0.57	0.61	0.17
	Mean Length(mm)						480 ± -	492 ± -	486 ± 8.48
	Mean Weight(g)						2140 ± -	2280 ± -	2210 ± 98.99

Total effort for each mesh size was 425 yards of net.
± = standard deviation
* = Based on 15 gangs(total mesh effort of 375 yds of net) since fish from gangs 4 and 6 were counted only.

Table 26. Mesh size effects on shorthead redhorse sucker, white sucker, goldeye, yellow perch and freshwater drum catches from East Cross Lake, 1987.

Species		Mesh size (inches)							
		1.50	2.00	3.00	3.75	4.25	5.00	5.25	Total
White sucker	Number caught			8	23	25	19	11	86
	CUE (No/100 yds/day)			2.29	6.57	7.14	5.43	3.14	3.51
	CUE (Kg/100 yds/day)			2.73	7.42	9.95	9.13	5.92	5.02
	Mean Length(mm)			402 ± 68.66	407 ± 38.43	436 ± 32.80	466 ± 28.35	489 ± 30.19	438 ± 47.40
	Mean Weight(g)			1195 ± 609.94	1130 ± 300.13	1393 ± 299.88	1683 ± 253.64	1884 ± 314.40	1431 ± 418.94
Shorthead redhorse sucker	Number caught	1	8	5	5	6	1	3	29
	CUE (No/100 yds/day)	0.29	2.29	1.43	1.43	1.71	0.29	0.86	1.18
	CUE (Kg/100 yds/day)	0.22	2.12	1.40	1.42	1.83	0.31	1.15	1.21
	Mean Length(mm)	374 ± -	370 ± 26.67	387 ± 29.07	390 ± 23.55	393 ± 20.66	404 ± -	427 ± 20.82	388 ± 27.52
	Mean Weight(g)	760 ± -	928 ± 196.01	982 ± 212.30	994 ± 224.23	1068 ± 122.38	1080 ± -	1340 ± 280.00	1020 ± 219.86
Goldeye	Number caught				1				1
	CUE (No/100 yds/day)				0.29				0.04
	CUE (Kg/100 yds/day)				0.15				0.02
	Mean Length(mm)				352 ± -				352 ± -
	Mean Weight(g)				520 ± -				520 ± -
Yellow perch	Number caught	7	6	7					20
	CUE (No/100 yds/day)	2.00	1.71	2.00					0.82
	CUE (Kg/100 yds/day)	0.14	0.28	0.62					0.15
	Mean Length(mm)	165 ± 26.75	207 ± 38.32	261 ± 9.65					211 ± 48.66
	Mean Weight(g)	70 ± 39.51	162 ± 84.72	311 ± 34.85					182 ± 117.00
Freshwater drum	Number caught						1		1
	CUE (No/100 yds/day)						0.27		0.04
	CUE (Kg/100 yds/day)						0.43		0.06
	Mean Length(mm)						438 ± -		438 ± -
	Mean Weight(g)						1490 ± -		1490 ± -

Total effort for each mesh size was 425 yards of net.
± = standard deviation

Table 27. Age specific size and maturity conditions of whitefish from Sipiwesk Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
	6	4	3	75.0	348 ± 33.97	700 ± 305.40	1.57
	7	1	1	100.0	450 ± -	1480 ± -	1.62
	8	3	3	100.0	433 ± 32.52	1533 ± 293.66	1.87
	10	1	1	100.0	463 ± -	1730 ± -	1.74
	11	1	1	100.0	489 ± -	2265 ± -	1.94
	13	1	1	100.0	427 ± -	1580 ± -	2.03
	14	1	1	100.0	484 ± -	2160 ± -	1.91
	15	1	1	100.0	466 ± -	1560 ± -	1.54
	16	1	1	100.0	499 ± -	2360 ± -	1.90
	22	1	1	100.0	488 ± -	2080 ± -	1.79
Total		15	14	93.3	431 ± 59.55	1508 ± 607.97	1.76
Females	2	1	0	0.0	140 ± -	28 ± -	1.02
	4	1	0	0.0	307 ± -	420 ± -	1.45
	5	2	2	100.0	343 ± 65.76	662 ± 379.01	1.55
	6	4	2	50.0	369 ± 13.30	765 ± 100.83	1.52
	7	2	2	100.0	413 ± 14.85	1265 ± 7.07	1.81
	8	5	5	100.0	472 ± 38.16	1916 ± 483.09	1.79
	9	5	5	100.0	470 ± 44.05	2263 ± 740.98	2.11
	10	2	2	100.0	453 ± 67.18	1835 ± 1110.16	1.84
	11	1	1	100.0	476 ± -	2160 ± -	2.00
	13	1	1	100.0	522 ± -	2810 ± -	1.98
	14	1	1	100.0	522 ± -	2950 ± -	2.07
	15	2	2	100.0	476 ± 16.26	1935 ± 120.21	1.80
	20	2	2	100.0	519 ± 7.07	2585 ± 176.78	1.85
Total		29	25	86.2	433 ± 86.60	1686 ± 877.86	1.79
Both	2	1	0	0.0	140 ± -	28 ± -	1.02
	4	1	0	0.0	307 ± -	420 ± -	1.45
	5	2	2	100.0	343 ± 65.76	662 ± 379.01	1.55
	6	8	5	62.5	359 ± 26.39	733 ± 213.39	1.54
	7	3	3	100.0	425 ± 24.06	1337 ± 124.23	1.75
	8	8	8	100.0	457 ± 39.07	1773 ± 444.10	1.82
	9	5	5	100.0	470 ± 44.05	2263 ± 740.98	2.11
	10	3	3	100.0	456 ± 47.89	1800 ± 787.34	1.81
	11	2	2	100.0	483 ± 9.19	2213 ± 74.25	1.97
	13	2	2	100.0	475 ± 67.18	2195 ± 869.74	2.00
	14	2	2	100.0	503 ± 26.87	2555 ± 558.61	1.99
	15	3	3	100.0	472 ± 12.74	1810 ± 232.59	1.71
	16	1	1	100.0	499 ± -	2360 ± -	1.90
	20	2	2	100.0	519 ± 7.07	2585 ± 176.78	1.85
	22	1	1	100.0	488 ± -	2080 ± -	1.79
Total		44	39	88.6	432 ± 77.72	1625 ± 793.38	1.78

± = standard deviation

Table 28. Age specific size and maturity conditions of whitefish from West Cross Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	1	1	0	0.0	157 ± -	44 ± -	1.14
	2	2	0	0.0	224 ± 50.91	178 ± 144.96	1.36
	4	6	6	100.0	426 ± 20.83	1372 ± 263.39	1.76
	5	2	2	100.0	441 ± 21.92	1520 ± 254.56	1.77
	6	1	1	100.0	451 ± -	1850 ± -	2.02
	8	2	2	100.0	464 ± 11.31	1870 ± 296.98	1.86
	18	1	1	100.0	552 ± -	2850 ± -	1.69
Total		15	12	80.0	398 ± 109.38	1341 ± 759.52	1.69
	4	10	7	70.0	409 ± 15.52	1268 ± 229.34	1.84
	7	1	1	100.0	494 ± -	2350 ± -	1.95
	8	1	1	100.0	440 ± -	1720 ± -	2.02
	15	2	2	100.0	507 ± 52.33	2440 ± 509.12	1.87
	16	1	1	100.0	555 ± -	3350 ± -	1.96
Total		15	12	80.0	440 ± 53.17	1665 ± 698.03	1.87
Both	1	1	0	0.0	157 ± -	44 ± -	1.14
	2	2	0	0.0	224 ± 50.91	178 ± 144.96	1.36
	4	16	13	81.3	415 ± 18.95	1307 ± 239.52	1.81
	5	2	2	100.0	441 ± 21.92	1520 ± 254.56	1.77
	6	1	1	100.0	451 ± -	1850 ± -	2.02
	7	1	1	100.0	494 ± -	2350 ± -	1.95
	8	3	3	100.0	456 ± 16.00	1820 ± 227.16	1.92
	15	2	2	100.0	507 ± 52.33	2440 ± 509.12	1.87
	16	1	1	100.0	555 ± -	3350 ± -	1.96
	18	1	1	100.0	552 ± -	2850 ± -	1.69
Total		30	24	80.0	419 ± 87.09	1503 ± 735.51	1.78

± = standard deviation
Number of fish with unknown sex that were excluded = 10

Table 29. Age specific size and maturity conditions of whitefish from East Cross Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	1	22	2	9.1	185 ± 9.71	93 ± 13.34	1.46
	2	1	1	100.0	312 ± -	500 ± -	1.65
	3	3	1	33.3	384 ± 6.93	940 ± 60.00	1.66
	4	16	13	81.3	417 ± 14.64	1299 ± 175.87	1.78
	5	5	5	100.0	452 ± 8.41	1298 ± 443.31	1.40
	6	1	1	100.0	436 ± -	1680 ± -	2.03
	7	1	1	100.0	510 ± -	2400 ± -	1.81
	8	2	2	100.0	493 ± 7.07	2375 ± 176.78	1.99
	9	2	2	100.0	497 ± 26.87	2445 ± 261.63	1.99
Total		53	28	52.8	328 ± 125.93	875 ± 773.82	1.63
Females	1	13	0	0.0	184 ± 11.69	92 ± 21.25	1.47
	2	1	0	0.0	276 ± -	340 ± -	1.62
	3	1	0	0.0	392 ± -	1140 ± -	1.89
	4	15	6	40.0	413 ± 19.35	1284 ± 175.53	1.83
	5	3	3	100.0	468 ± 24.33	1957 ± 153.08	1.91
	6	5	5	100.0	469 ± 32.61	2080 ± 215.87	2.04
	8	2	2	100.0	514 ± 22.63	2590 ± 579.83	1.89
	9	2	2	100.0	520 ± 19.80	2905 ± 247.49	2.06
	19	1	1	100.0	594 ± -	3880 ± -	1.85
Total		43	19	44.2	364 ± 130.42	1234 ± 979.43	1.76
Both	1	35	2	5.7	185 ± 10.35	92 ± 16.43	1.46
	2	2	1	50.0	294 ± 25.46	420 ± 113.14	1.63
	3	4	1	25.0	386 ± 6.93	990 ± 111.36	1.72
	4	31	19	61.3	415 ± 16.95	1292 ± 172.92	1.80
	5	8	8	100.0	458 ± 16.78	1545 ± 484.97	1.59
	6	6	6	100.0	463 ± 32.09	2013 ± 252.88	2.03
	7	1	1	100.0	510 ± -	2400 ± -	1.81
	8	4	4	100.0	504 ± 18.28	2483 ± 371.34	1.94
	9	4	4	100.0	509 ± 23.40	2675 ± 337.29	2.03
	19	1	1	100.0	594 ± -	3880 ± -	1.85
Total		96	47	49.0	344 ± 128.53	1036 ± 885.53	1.69

± = standard deviation

Table 30. Age specific size and maturity conditions of cisco from Sipiwesk Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
	0	1	0	0.0	156 ± -	46 ± -	1.21
Males	2	31	1	3.2	160 ± 11.35	53 ± 13.00	1.27
	3	63	16	25.4	205 ± 22.24	124 ± 52.75	1.36
	4	8	0	0.0	270 ± 33.36	286 ± 84.97	1.44
	5	15	14	93.3	272 ± 33.47	310 ± 167.93	1.44
	6	26	22	84.6	306 ± 20.02	465 ± 111.41	1.59
	7	15	14	93.3	318 ± 25.43	534 ± 160.20	1.61
	8	11	11	100.0	331 ± 35.26	631 ± 259.64	1.65
	9	12	12	100.0	322 ± 24.07	566 ± 125.11	1.68
	10	9	9	100.0	346 ± 28.35	733 ± 208.86	1.73
	11	1	1	100.0	350 ± -	616 ± -	1.44
	12	1	1	100.0	324 ± -	670 ± -	1.97
Total		193	101	52.3	250 ± 67.82	301 ± 248.95	1.46
Females	2	29	4	13.8	166 ± 13.59	57 ± 17.94	1.23
	3	65	14	21.5	215 ± 27.13	142 ± 83.45	1.34
	4	12	5	41.7	243 ± 25.51	215 ± 89.98	1.43
	5	19	15	78.9	265 ± 30.93	294 ± 137.95	1.49
	6	25	16	64.0	312 ± 26.20	481 ± 148.40	1.55
	7	11	10	90.9	303 ± 36.18	467 ± 207.08	1.58
	8	6	6	100.0	337 ± 22.07	655 ± 252.41	1.64
	9	21	18	85.7	326 ± 32.34	570 ± 207.95	1.58
	10	12	12	100.0	347 ± 25.69	670 ± 152.18	1.58
	11	7	7	100.0	354 ± 24.99	832 ± 272.52	1.81
	12	1	1	100.0	344 ± -	810 ± -	1.99
	13	3	3	100.0	336 ± 37.29	633 ± 239.81	1.61
Total		211	111	52.6	259 ± 66.54	325 ± 265.10	1.45
	0	1	0	0.0	156 ± -	46 ± -	1.21
Both	2	60	5	8.3	163 ± 12.78	55 ± 15.64	1.25
	3	128	30	23.4	210 ± 25.19	133 ± 70.31	1.35
	4	20	5	25.0	253 ± 31.16	243 ± 92.97	1.44
	5	34	29	85.3	268 ± 31.80	301 ± 149.68	1.47
	6	51	38	74.5	309 ± 23.17	473 ± 129.78	1.57
	7	26	24	92.3	312 ± 30.66	506 ± 180.68	1.60
	8	17	17	100.0	333 ± 30.64	639 ± 249.38	1.65
	9	33	30	90.9	325 ± 29.29	568 ± 180.03	1.61
	10	21	21	100.0	346 ± 26.17	697 ± 176.65	1.65
	11	8	8	100.0	354 ± 23.19	805 ± 263.61	1.76
	12	2	2	100.0	334 ± 14.14	740 ± 98.99	1.98
	13	3	3	100.0	336 ± 37.29	633 ± 239.81	1.61
Total		404	212	52.5	255 ± 67.22	314 ± 257.48	1.46

± = standard deviation

Number of fish with unknown sex that were excluded = 23
Number of fish with unknown mat that were excluded = 4

Table 31. Age specific size and maturity conditions of cisco from West Cross Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	1	60	2	3.3	148 ± 14.88	50 ± 24.60	1.50
	2	4	1	25.0	219 ± 48.84	175 ± 97.21	1.44
	3	16	12	75.0	275 ± 39.91	406 ± 249.76	1.74
	4	18	18	100.0	340 ± 35.24	771 ± 204.90	1.90
	5	7	7	100.0	321 ± 27.05	565 ± 163.71	1.68
	6	4	4	100.0	340 ± 25.87	732 ± 227.58	1.81
	8	1	1	100.0	320 ± -	520 ± -	1.59
	9	2	2	100.0	365 ± 49.50	970 ± 466.69	1.91
	10	2	2	100.0	365 ± 21.21	820 ± 28.28	1.70
Total		114	49	43.0	225 ± 90.07	308 ± 338.33	1.63
Females	1	26	0	0.0	148 ± 13.00	47 ± 14.78	1.44
	2	4	3	75.0	197 ± 38.45	135 ± 63.91	1.63
	3	11	8	72.7	309 ± 36.82	589 ± 254.46	1.86
	4	20	20	100.0	360 ± 40.11	984 ± 305.67	2.05
	5	8	8	100.0	322 ± 42.18	692 ± 380.07	1.88
	6	8	8	100.0	393 ± 35.73	1240 ± 272.50	2.05
	7	3	3	100.0	321 ± 9.02	543 ± 63.51	1.63
	8	7	7	100.0	376 ± 71.99	1119 ± 740.69	1.81
	9	3	3	100.0	327 ± 11.02	643 ± 40.41	1.84
Total		90	60	66.7	284 ± 101.55	609 ± 522.15	1.78
Both	1	86	2	2.3	148 ± 14.26	49 ± 22.06	1.48
	2	8	4	50.0	208 ± 42.32	155 ± 79.07	1.53
	3	27	20	74.1	289 ± 41.56	481 ± 263.26	1.79
	4	38	38	100.0	351 ± 38.64	883 ± 280.88	1.98
	5	15	15	100.0	321 ± 34.69	633 ± 296.66	1.79
	6	12	12	100.0	375 ± 40.94	1071 ± 351.97	1.97
	7	3	3	100.0	321 ± 9.02	543 ± 63.51	1.63
	8	8	8	100.0	369 ± 69.57	1044 ± 717.65	1.78
	9	5	5	100.0	342 ± 33.15	774 ± 295.43	1.86
	10	2	2	100.0	365 ± 21.21	820 ± 28.28	1.70
Total		204	109	53.4	251 ± 99.42	440 ± 453.51	1.69

± = standard deviation

Number of fish with unknown age that were excluded = 96

Number of fish with unknown sex that were excluded = 165

Number of fish with unknown mat that were excluded = 109

Table 32. Age specific size and maturity conditions of cisco from East Cross Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	1	111	1	0.9	152 ± 9.47	53 ± 16.31	1.47
	2	21	13	61.9	214 ± 35.64	170 ± 88.24	1.58
	3	5	5	100.0	294 ± 25.27	476 ± 170.97	1.82
	4	25	25	100.0	325 ± 27.59	688 ± 188.82	1.97
	5	13	13	100.0	340 ± 15.63	767 ± 129.77	1.94
	6	12	12	100.0	356 ± 19.58	920 ± 133.76	2.04
	7	1	1	100.0	342 ± -	840 ± -	2.10
	8	3	3	100.0	405 ± 37.81	1217 ± 303.70	1.81
Total		191	73	38.2	216 ± 85.69	286 ± 347.87	1.64
Females	1	82	0	0.0	151 ± 6.94	52 ± 10.08	1.48
	2	16	8	50.0	215 ± 26.61	168 ± 61.64	1.61
	3	10	8	80.0	285 ± 28.43	428 ± 134.56	1.78
	4	26	26	100.0	345 ± 23.69	856 ± 211.59	2.05
	5	23	23	100.0	360 ± 14.70	953 ± 155.70	2.03
	6	4	4	100.0	373 ± 27.25	1175 ± 240.35	2.25
	7	3	3	100.0	375 ± 19.43	1220 ± 330.45	2.27
	8	2	2	100.0	439 ± 4.24	1825 ± 106.07	2.16
Total		166	74	44.6	238 ± 96.56	406 ± 454.11	1.72
Both	1	193	1	0.5	152 ± 8.49	52 ± 13.99	1.48
	2	37	21	56.8	214 ± 31.64	169 ± 76.88	1.60
	3	15	13	86.7	288 ± 26.81	444 ± 143.32	1.79
	4	51	51	100.0	335 ± 27.38	773 ± 216.12	2.01
	5	36	36	100.0	353 ± 17.71	886 ± 171.09	2.00
	6	16	16	100.0	360 ± 22.16	984 ± 194.11	2.09
	7	4	4	100.0	367 ± 23.01	1125 ± 330.00	2.22
	8	5	5	100.0	418 ± 32.75	1460 ± 399.94	1.95
Total		357	147	41.2	226 ± 91.42	342 ± 404.70	1.67

± = standard deviation

Number of fish with unknown age that were excluded = 4

Number of fish with unknown sex that were excluded = 4

Number of fish with unknown mat that were excluded = 4

Table 33. Age specific size and maturity conditions of walleye from Sipiwesk Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	3	7	1	14.3	223 ± 25.11	124 ± 43.93	1.09
	4	20	1	5.0	245 ± 51.06	187 ± 101.50	1.48
	5	3	0	0.0	287 ± 17.01	258 ± 57.98	1.07
	6	37	15	40.5	332 ± 34.07	403 ± 132.54	1.11
	7	6	0	0.0	327 ± 23.31	383 ± 73.67	1.09
	8	23	14	60.9	350 ± 25.07	476 ± 102.03	1.10
	9	3	2	66.7	345 ± 42.36	473 ± 198.58	1.09
	10	11	9	81.8	367 ± 19.00	553 ± 72.46	1.12
	11	12	9	75.0	367 ± 14.69	542 ± 63.10	1.09
	12	13	13	100.0	385 ± 27.89	644 ± 181.49	1.11
	13	5	4	80.0	379 ± 26.93	604 ± 124.28	1.10
	14	19	18	94.7	382 ± 18.04	594 ± 120.63	1.06
	15	1	0	0.0	382 ± -	572 ± -	1.03
	16	1	0	0.0	388 ± -	708 ± -	1.21
	18	2	2	100.0	386 ± 10.61	643 ± 123.74	1.12
	19	1	1	100.0	390 ± -	625 ± -	1.05
	20	1	1	100.0	396 ± -	669 ± -	1.08
	21	1	1	100.0	420 ± -	900 ± -	1.21
	23	1	1	100.0	380 ± -	600 ± -	1.09
	24	1	1	100.0	415 ± -	687 ± -	0.96
Total		168	93	55.4	338 ± 56.86	454 ± 191.17	1.14
Females	3	2	0	0.0	210 ± 1.41	96 ± 3.54	1.03
	4	22	1	4.5	259 ± 25.16	188 ± 53.25	1.05
	5	3	0	0.0	305 ± 2.65	296 ± 24.09	1.04
	6	26	3	11.5	344 ± 27.33	454 ± 131.87	1.09
	7	4	1	25.0	353 ± 14.03	488 ± 48.36	1.11
	8	18	10	55.6	371 ± 16.52	553 ± 85.63	1.07
	9	6	5	83.3	346 ± 25.77	456 ± 95.98	1.09
	10	8	8	100.0	374 ± 14.16	581 ± 77.36	1.10
	11	6	5	83.3	394 ± 29.81	709 ± 268.97	1.12
	12	10	9	90.0	388 ± 21.05	577 ± 116.65	0.99
	13	4	3	75.0	402 ± 47.89	740 ± 300.67	1.08
	14	13	13	100.0	414 ± 42.75	837 ± 336.80	1.13
	15	3	3	100.0	402 ± 38.57	787 ± 299.39	1.17
	16	1	1	100.0	357 ± -	555 ± -	1.22
	17	6	5	83.3	429 ± 55.51	845 ± 352.88	1.03
	18	1	1	100.0	405 ± -	758 ± -	1.14
	21	1	1	100.0	517 ± -	1810 ± -	1.31
	26	1	1	100.0	510 ± -	1510 ± -	1.14
Total		135	70	51.9	355 ± 62.85	535 ± 299.67	1.08
Both	3	9	1	11.1	220 ± 22.50	118 ± 40.08	1.08
	4	42	2	4.8	252 ± 39.74	187 ± 78.91	1.26
	5	6	0	0.0	296 ± 14.57	277 ± 45.00	1.06
	6	63	18	28.6	337 ± 31.79	424 ± 133.64	1.10
	7	10	1	10.0	338 ± 23.48	425 ± 82.04	1.10
	8	41	24	58.5	359 ± 24.03	510 ± 101.77	1.09
	9	9	7	77.8	346 ± 29.39	462 ± 125.27	1.09
	10	19	17	89.5	370 ± 17.14	565 ± 73.83	1.11
	11	18	14	77.8	376 ± 23.82	598 ± 174.38	1.10
	12	23	22	95.7	386 ± 24.66	614 ± 157.11	1.06
	13	9	7	77.8	389 ± 36.93	665 ± 216.17	1.09
	14	32	31	96.9	395 ± 34.12	693 ± 258.91	1.09
	15	4	3	75.0	397 ± 33.05	733 ± 266.98	1.13
	16	2	1	50.0	373 ± 21.92	632 ± 108.19	1.22
	17	6	5	83.3	429 ± 55.51	845 ± 352.88	1.03
	18	3	3	100.0	392 ± 13.53	681 ± 110.01	1.12
	19	1	1	100.0	390 ± -	625 ± -	1.05
	20	1	1	100.0	396 ± -	669 ± -	1.08
	21	2	2	100.0	469 ± 68.59	1355 ± 643.47	1.26
	23	1	1	100.0	380 ± -	600 ± -	1.09
	24	1	1	100.0	415 ± -	687 ± -	0.96
	26	1	1	100.0	510 ± -	1510 ± -	1.14
Total		303	163	53.8	346 ± 60.11	490 ± 248.36	1.12

± = standard deviation
Number of fish with unknown sex that were excluded = 3

Table 34. Age specific size and maturity conditions of walleye from West Cross Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	1	1	0	0.0	152 ± -	40 ± -	1.14
	2	1	0	0.0	210 ± -	104 ± -	1.12
	4	9	0	0.0	310 ± 12.59	337 ± 40.84	1.13
	5	4	2	50.0	353 ± 25.04	510 ± 126.02	1.15
	6	33	22	66.7	379 ± 23.53	638 ± 142.88	1.15
	7	4	4	100.0	406 ± 21.23	777 ± 112.29	1.16
	8	38	35	92.1	415 ± 20.73	832 ± 142.85	1.16
	9	4	3	75.0	367 ± 79.69	635 ± 347.23	1.12
	10	4	4	100.0	416 ± 19.82	886 ± 191.46	1.22
	11	8	8	100.0	430 ± 13.26	951 ± 117.15	1.19
	12	7	7	100.0	429 ± 21.24	960 ± 218.56	1.21
	13	8	8	100.0	438 ± 20.21	1044 ± 121.18	1.24
	14	10	10	100.0	428 ± 18.53	1016 ± 127.38	1.30
	15	5	5	100.0	428 ± 22.98	958 ± 123.57	1.23
	16	3	3	100.0	458 ± 3.79	1197 ± 95.04	1.25
	17	4	4	100.0	444 ± 7.59	1108 ± 120.93	1.26
Total		143	115	80.4	399 ± 48.36	788 ± 256.91	1.18
Females	3	4	0	0.0	262 ± 19.21	200 ± 59.05	1.09
	4	8	1	12.5	323 ± 76.85	480 ± 470.49	1.21
	5	3	0	0.0	341 ± 23.44	458 ± 131.82	1.13
	6	33	6	18.2	393 ± 29.12	722 ± 153.95	1.18
	7	10	9	90.0	426 ± 25.38	941 ± 172.34	1.21
	8	70	64	91.4	439 ± 19.92	1025 ± 190.05	1.20
	9	2	2	100.0	424 ± 16.97	910 ± 70.71	1.19
	10	1	1	100.0	458 ± -	1070 ± -	1.11
	11	15	15	100.0	474 ± 25.62	1335 ± 231.05	1.24
	12	5	5	100.0	469 ± 29.90	1290 ± 282.31	1.24
	13	5	5	100.0	466 ± 25.48	1298 ± 389.90	1.25
	14	3	3	100.0	484 ± 17.78	1500 ± 264.58	1.31
	15	2	2	100.0	451 ± 24.75	965 ± 21.21	1.07
	17	6	6	100.0	486 ± 27.88	1453 ± 337.20	1.25
	19	1	1	100.0	514 ± -	1440 ± -	1.06
	23	1	1	100.0	520 ± -	1650 ± -	1.17
Total		169	121	71.6	426 ± 53.94	977 ± 351.97	1.20
Both	1	1	0	0.0	152 ± -	40 ± -	1.14
	2	1	0	0.0	210 ± -	104 ± -	1.12
	3	4	0	0.0	262 ± 19.21	200 ± 59.05	1.09
	4	17	1	5.9	316 ± 52.01	404 ± 321.15	1.17
	5	7	2	28.6	348 ± 23.07	488 ± 120.41	1.14
	6	66	28	42.4	386 ± 27.18	680 ± 153.46	1.16
	7	14	13	92.9	420 ± 25.22	894 ± 171.42	1.19
	8	108	99	91.7	430 ± 23.10	957 ± 197.42	1.19
	9	6	5	83.3	386 ± 68.81	727 ± 305.79	1.14
	10	5	5	100.0	424 ± 25.61	923 ± 185.05	1.20
	11	23	23	100.0	459 ± 30.52	1202 ± 270.95	1.23
	12	12	12	100.0	445 ± 31.56	1098 ± 289.67	1.22
	13	13	13	100.0	449 ± 25.56	1142 ± 275.34	1.24
	14	13	13	100.0	441 ± 30.40	1128 ± 262.46	1.30
	15	7	7	100.0	434 ± 24.07	960 ± 101.32	1.18
	16	3	3	100.0	458 ± 3.79	1197 ± 95.04	1.25
	17	10	10	100.0	469 ± 30.08	1315 ± 316.13	1.26
	19	1	1	100.0	514 ± -	1440 ± -	1.06
	23	1	1	100.0	520 ± -	1650 ± -	1.17
Total		312	236	75.6	414 ± 53.06	890 ± 325.51	1.19

± = standard deviation
Number of fish with unknown sex that were excluded = 9
Numuer of fish with unknown mat that were excluded = 8

Table 35. Age specific size and maturity conditions of walleye from East Cross Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	1	8	0	0.0	175 ± 11.95	62 ± 18.24	1.13
	2	1	0	0.0	188 ± -	75 ± -	1.13
	4	31	4	12.9	348 ± 20.12	527 ± 87.88	1.24
	5	15	6	40.0	364 ± 19.73	597 ± 99.12	1.23
	6	54	46	85.2	401 ± 25.45	816 ± 138.97	1.26
	7	6	4	66.7	406 ± 21.44	845 ± 146.53	1.25
	8	14	14	100.0	414 ± 17.83	922 ± 145.93	1.29
	9	3	3	100.0	423 ± 4.16	843 ± 98.15	1.11
	10	3	3	100.0	429 ± 36.46	1047 ± 202.57	1.32
	11	6	6	100.0	436 ± 8.50	1060 ± 100.20	1.28
	12	5	5	100.0	436 ± 15.68	1068 ± 103.54	1.29
	13	17	17	100.0	448 ± 18.24	1176 ± 123.80	1.30
	14	9	9	100.0	441 ± 18.19	1129 ± 137.43	1.31
	15	2	2	100.0	468 ± 14.14	1410 ± 127.28	1.37
	16	2	2	100.0	440 ± 2.83	1200 ± 70.71	1.41
	17	5	5	100.0	449 ± 15.21	1186 ± 69.14	1.31
	18	2	2	100.0	445 ± 15.56	1080 ± 28.28	1.23
	21	1	1	100.0	490 ± -	1440 ± -	1.22
Total		184	129	70.1	392 ± 63.00	816 ± 305.84	1.26
Females	1	1	0	0.0	182 ± -	56 ± -	0.93
	2	1	0	0.0	190 ± -	64 ± -	0.93
	3	4	0	0.0	293 ± 18.80	285 ± 45.09	1.13
	4	15	9	60.0	348 ± 24.62	515 ± 98.91	1.21
	5	23	8	34.8	371 ± 27.56	643 ± 165.13	1.24
	6	55	42	76.4	410 ± 31.63	871 ± 197.80	1.24
	7	13	12	92.3	414 ± 34.53	932 ± 207.72	1.30
	8	32	30	93.8	452 ± 15.16	1171 ± 127.38	1.27
	9	3	3	100.0	487 ± 9.02	1460 ± 121.66	1.26
	11	8	7	87.5	465 ± 10.78	1300 ± 130.60	1.29
	12	12	12	100.0	473 ± 16.26	1376 ± 145.38	1.30
	13	12	12	100.0	484 ± 16.38	1471 ± 173.23	1.30
	14	5	5	100.0	472 ± 31.70	1376 ± 267.36	1.30
	15	2	2	100.0	469 ± 1.41	1425 ± 91.92	1.38
	16	1	1	100.0	534 ± -	1800 ± -	1.18
	17	3	3	100.0	480 ± 26.46	1487 ± 382.80	1.32
Total		190	146	76.8	419 ± 56.96	980 ± 366.61	1.26
Both	1	9	0	0.0	176 ± 11.40	61 ± 17.18	1.11
	2	2	0	0.0	189 ± 1.41	70 ± 7.78	1.03
	3	4	0	0.0	293 ± 18.80	285 ± 45.09	1.13
	4	46	13	28.3	348 ± 21.41	523 ± 90.67	1.23
	5	38	14	36.8	368 ± 24.75	625 ± 143.07	1.24
	6	109	88	80.7	406 ± 28.98	844 ± 172.62	1.25
	7	19	16	84.2	411 ± 30.59	904 ± 190.88	1.28
	8	46	44	95.7	440 ± 23.59	1096 ± 175.44	1.28
	9	6	6	100.0	455 ± 35.25	1152 ± 351.93	1.19
	10	3	3	100.0	429 ± 36.46	1047 ± 202.57	1.32
	11	14	13	92.9	452 ± 17.52	1197 ± 168.04	1.29
	12	17	17	100.0	462 ± 23.35	1285 ± 195.23	1.30
	13	29	29	100.0	463 ± 24.57	1298 ± 205.92	1.30
	14	14	14	100.0	452 ± 27.41	1217 ± 220.71	1.31
	15	4	4	100.0	469 ± 8.23	1418 ± 91.06	1.38
	16	3	3	100.0	471 ± 54.31	1400 ± 350.00	1.33
	17	8	8	100.0	461 ± 24.35	1299 ± 262.32	1.32
	18	2	2	100.0	445 ± 15.56	1080 ± 28.28	1.23
	21	1	1	100.0	490 ± -	1440 ± -	1.22
Total		374	275	73.5	406 ± 61.45	900 ± 347.46	1.26

± = standard deviation

Table 36. Age specific size and maturity conditions of sauger from Sipiwesk Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	3	8	1	12.5	220 ± 12.21	101 ± 14.39	0.94
	4	25	1	4.0	230 ± 19.17	113 ± 25.67	0.92
	5	16	5	31.3	261 ± 14.65	167 ± 34.43	0.94
	6	22	9	40.9	267 ± 23.60	176 ± 51.28	0.91
	7	5	2	40.0	300 ± 25.82	253 ± 55.83	0.93
	8	4	2	50.0	301 ± 28.61	245 ± 85.23	0.88
	9	2	2	100.0	328 ± 2.83	308 ± 3.54	0.87
	10	9	7	77.8	324 ± 20.48	326 ± 61.60	0.95
	11	8	7	87.5	334 ± 22.01	340 ± 85.46	0.90
	12	3	3	100.0	343 ± 25.01	341 ± 73.38	0.84
	14	4	3	75.0	316 ± 55.28	321 ± 135.55	0.97
	16	1	1	100.0	329 ± -	310 ± -	0.87
Total		107	43	40.2	272 ± 44.34	199 ± 99.28	0.92
Females	3	13	0	0.0	211 ± 11.36	88 ± 16.72	0.94
	4	27	1	3.7	230 ± 21.96	119 ± 36.78	0.95
	5	22	3	13.6	263 ± 25.94	178 ± 64.85	0.94
	6	45	14	31.1	276 ± 30.67	197 ± 63.92	0.90
	7	8	5	62.5	315 ± 30.67	293 ± 71.33	0.93
	8	9	5	55.6	321 ± 28.24	294 ± 71.14	0.87
	9	5	2	40.0	325 ± 12.72	311 ± 53.03	0.90
	10	12	10	83.3	328 ± 27.01	300 ± 66.43	0.85
	11	9	7	77.8	342 ± 23.88	338 ± 62.91	0.84
	12	4	3	75.0	346 ± 30.93	373 ± 96.12	0.89
	13	3	3	100.0	354 ± 25.50	374 ± 59.08	0.84
	14	2	2	100.0	369 ± 21.21	350 ± 0.00	0.70
	15	1	1	100.0	372 ± -	394 ± -	0.77
Total		160	56	35.0	280 ± 49.61	213 ± 101.22	0.90
Both	3	21	1	4.8	214 ± 12.33	93 ± 16.68	0.94
	4	52	2	3.8	230 ± 20.47	116 ± 31.75	0.93
	5	38	8	21.1	262 ± 21.67	173 ± 53.80	0.94
	6	67	23	34.3	273 ± 28.70	190 ± 60.53	0.90
	7	13	7	53.8	309 ± 28.77	278 ± 66.55	0.93
	8	13	7	53.8	315 ± 28.86	279 ± 75.80	0.87
	9	7	4	57.1	326 ± 10.54	310 ± 43.36	0.89
	10	21	17	81.0	326 ± 23.91	311 ± 64.23	0.89
	11	17	14	82.4	338 ± 22.66	339 ± 71.94	0.87
	12	7	6	85.7	345 ± 26.27	359 ± 81.86	0.87
	13	3	3	100.0	354 ± 25.50	374 ± 59.08	0.84
	14	6	5	83.3	334 ± 51.63	331 ± 106.04	0.88
	15	1	1	100.0	372 ± -	394 ± -	0.77
	16	1	1	100.0	329 ± -	310 ± -	0.87
Total		267	99	37.1	277 ± 47.63	207 ± 100.48	0.91

± = standard deviation
Number of fish with unknown sex that were excluded = 11

Table 37. Age specific size and maturity conditions of sauger from West Cross Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
	4	1	1	100.0	246 ± -	130 ± -	0.87
	8	1	1	100.0	338 ± -	368 ± -	0.95
Total		2	2	100.0	292 ± 65.05	249 ± 168.29	0.91
	5	1	0	0.0	256 ± -	148 ± -	0.88
	6	2	1	50.0	270 ± 8.49	184 ± 19.80	0.93
	10	1	1	100.0	380 ± -	550 ± -	1.00
	11	1	1	100.0	390 ± -	570 ± -	0.96
	13	1	1	100.0	408 ± -	680 ± -	1.00
Total		6	4	66.7	329 ± 70.61	386 ± 239.09	0.95
	4	1	1	100.0	246 ± -	130 ± -	0.87
	5	1	0	0.0	256 ± -	148 ± -	0.88
	6	2	1	50.0	270 ± 8.49	184 ± 19.80	0.93
	8	1	1	100.0	338 ± -	368 ± -	0.95
	10	1	1	100.0	380 ± -	550 ± -	1.00
	11	1	1	100.0	390 ± -	570 ± -	0.96
	13	1	1	100.0	408 ± -	680 ± -	1.00
Total		8	6	75.0	320 ± 66.77	352 ± 221.14	0.94

± = standard deviation
Number of fish with unknown sex that were excluded = 1
Number of fish with unknown mat that were excluded = 1

Table 38. Age specific size and maturity conditions of northern pike from Sipiwesk Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	1	5	1	20.0	261 ± 41.14	133 ± 67.22	0.70
	2	15	5	33.3	317 ± 57.99	260 ± 127.23	0.80
	3	17	9	52.9	391 ± 58.77	452 ± 243.42	0.70
	4	13	8	61.5	471 ± 52.50	750 ± 254.61	0.69
	5	9	8	88.9	511 ± 69.77	930 ± 259.47	0.69
	6	12	11	91.7	538 ± 51.90	1077 ± 363.48	0.67
	7	6	6	100.0	541 ± 22.17	1134 ± 254.57	0.71
	8	7	7	100.0	592 ± 65.04	1659 ± 935.84	0.75
	9	1	1	100.0	624 ± -	1570 ± -	0.65
	10	1	1	100.0	850 ± -	4980 ± -	0.81
Total		86	57	66.3	451 ± 121.46	794 ± 712.85	0.72
Females	1	4	0	0.0	253 ± 33.18	117 ± 46.92	0.69
	2	7	1	14.3	326 ± 52.86	252 ± 141.51	0.67
	3	8	0	0.0	425 ± 42.60	569 ± 182.93	0.72
	4	19	6	31.6	489 ± 49.96	821 ± 253.07	0.69
	5	36	14	38.9	520 ± 39.58	974 ± 279.34	0.68
	6	35	19	54.3	551 ± 40.42	1087 ± 234.51	0.65
	7	30	23	76.7	567 ± 28.93	1237 ± 253.44	0.67
	8	12	9	75.0	608 ± 63.55	1686 ± 706.20	0.71
	9	4	2	50.0	685 ± 81.15	2641 ± 1151.78	0.78
	10	1	1	100.0	787 ± -	4040 ± -	0.83
	13	1	1	100.0	782 ± -	4380 ± -	0.92
Total		157	76	48.4	526 ± 93.09	1094 ± 641.73	0.68
Both	1	9	1	11.1	257 ± 35.73	126 ± 56.18	0.70
	2	22	6	27.3	320 ± 55.31	258 ± 128.57	0.76
	3	25	9	36.0	402 ± 55.60	490 ± 228.75	0.71
	4	32	14	43.8	481 ± 50.99	792 ± 252.07	0.69
	5	45	22	48.9	519 ± 46.31	965 ± 273.18	0.68
	6	47	30	63.8	548 ± 43.42	1084 ± 268.81	0.66
	7	36	29	80.6	563 ± 29.38	1220 ± 252.96	0.68
	8	19	16	84.2	602 ± 62.79	1676 ± 772.58	0.73
	9	5	3	60.0	673 ± 75.39	2427 ± 1106.56	0.75
	10	2	2	100.0	819 ± 44.55	4510 ± 664.68	0.82
	13	1	1	100.0	782 ± -	4380 ± -	0.92
Total		243	133	54.7	499 ± 109.93	988 ± 681.66	0.69

± = standard deviation

Number of fish with unknown sex that were excluded = 3

Table 39. Age specific size and maturity conditions of northern pike from West Cross Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	1	4	0	0.0	252 ± 34.42	121 ± 43.86	0.73
	2	9	5	55.6	388 ± 91.00	501 ± 368.83	0.73
	3	18	11	61.1	428 ± 59.48	566 ± 218.86	0.68
	4	47	33	70.2	484 ± 42.02	828 ± 240.79	0.71
	5	18	13	72.2	525 ± 49.44	1029 ± 264.06	0.70
	6	9	8	88.9	562 ± 32.37	1362 ± 231.13	0.76
	7	1	1	100.0	536 ± -	1180 ± -	0.77
Total		106	71	67.0	471 ± 80.81	809 ± 361.69	0.71
Females	1	2	0	0.0	250 ± 0.00	101 ± 1.41	0.65
	2	5	3	60.0	350 ± 52.47	316 ± 169.70	0.69
	3	15	4	26.7	441 ± 54.84	586 ± 192.66	0.66
	4	47	24	51.1	489 ± 49.45	823 ± 297.61	0.68
	5	40	27	67.5	534 ± 61.99	1090 ± 376.08	0.69
	6	19	15	78.9	592 ± 64.11	1428 ± 552.69	0.67
	7	15	13	86.7	655 ± 51.34	1958 ± 631.96	0.68
	8	12	10	83.3	687 ± 87.39	2407 ± 982.36	0.70
	9	3	3	100.0	709 ± 61.33	2540 ± 960.62	0.69
	10	3	3	100.0	797 ± 63.54	3990 ± 475.71	0.80
	14	1	1	100.0	802 ± -	4060 ± -	0.79
Total		162	103	63.6	542 ± 111.39	1244 ± 850.50	0.69
Both	1	6	0	0.0	251 ± 26.68	114 ± 35.44	0.70
	2	14	8	57.1	374 ± 79.39	435 ± 317.86	0.72
	3	33	15	45.5	434 ± 56.92	575 ± 204.45	0.67
	4	94	57	60.6	487 ± 45.70	825 ± 269.25	0.70
	5	58	40	69.0	531 ± 58.10	1071 ± 344.07	0.70
	6	28	23	82.1	582 ± 57.02	1407 ± 469.54	0.70
	7	16	14	87.5	647 ± 57.79	1909 ± 640.76	0.69
	8	12	10	83.3	687 ± 87.39	2407 ± 982.36	0.70
	9	3	3	100.0	709 ± 61.33	2540 ± 960.62	0.69
	10	3	3	100.0	797 ± 63.54	3990 ± 475.71	0.80
	14	1	1	100.0	802 ± -	4060 ± -	0.79
Total		268	174	64.9	514 ± 105.99	1071 ± 729.80	0.70

± = standard deviation

Number of fish with unknown age that were excluded = 2

Number of fish with unknown sex that were excluded = 5

Number of fish with unknown mat that were excluded = 4

Table 40. Age specific size and maturity conditions of northern pike from East Cross Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)	Wt ± s.d. (g)	Mean Condition Factor
Males	2	9	4	44.4	392 ± 59.04	470 ± 202.30	0.74
	3	29	19	65.5	455 ± 44.91	705 ± 189.60	0.74
	4	51	45	88.2	496 ± 37.66	907 ± 194.27	0.74
	5	42	39	92.9	539 ± 46.77	1207 ± 337.48	0.75
	6	9	9	100.0	558 ± 68.32	1382 ± 498.97	0.77
	7	12	10	83.3	620 ± 25.63	1739 ± 204.60	0.73
	8	1	1	100.0	558 ± -	1360 ± -	0.78
	9	1	1	100.0	688 ± -	2610 ± -	0.80
Total		156	128	82.1	506 ± 73.86	1021 ± 436.64	0.74
Females	0	1	0	0.0	206 ± -	180 ± -	2.06
	1	1	0	0.0	280 ± -	160 ± -	0.73
	2	2	0	0.0	273 ± 60.81	245 ± 7.07	1.41
	3	18	0	0.0	445 ± 32.47	642 ± 125.07	0.72
	4	39	4	10.3	505 ± 42.70	925 ± 231.84	0.71
	5	55	8	14.5	574 ± 54.32	1385 ± 445.77	0.71
	6	58	11	19.0	646 ± 62.31	1959 ± 657.08	0.70
	7	46	20	43.5	696 ± 70.92	2542 ± 925.64	0.72
	8	21	10	47.6	713 ± 77.43	2797 ± 1112.18	0.74
	9	10	5	50.0	767 ± 50.32	3474 ± 809.19	0.76
	10	2	2	100.0	819 ± 106.07	4835 ± 1576.85	0.87
	12	1	1	100.0	794 ± -	3600 ± -	0.72
Total		254	61	24.0	610 ± 114.94	1819 ± 1052.29	0.73
Both	0	1	0	0.0	206 ± -	180 ± -	2.06
	1	3	0	0.0	284 ± 4.00	163 ± 15.28	0.71
	2	11	4	36.4	370 ± 73.88	429 ± 202.56	0.86
	3	47	19	40.4	451 ± 40.48	681 ± 169.14	0.73
	4	90	49	54.4	500 ± 39.94	915 ± 210.32	0.72
	5	97	47	48.5	559 ± 53.96	1308 ± 410.25	0.73
	6	67	20	29.9	634 ± 69.57	1881 ± 665.03	0.71
	7	58	30	51.7	680 ± 71.11	2376 ± 890.01	0.73
	8	22	11	50.0	706 ± 82.46	2731 ± 1127.76	0.74
	9	11	6	54.5	760 ± 53.32	3395 ± 810.66	0.76
	10	2	2	100.0	819 ± 106.07	4835 ± 1576.85	0.87
	12	1	1	100.0	794 ± -	3600 ± -	0.72
Total		410	189	46.1	570 ± 113.11	1515 ± 952.70	0.73

± = standard deviation

Table 41. Length - weight regressions for fish caught from Sipiwesk Lake, 1987.

Species	Length-weight equation	r	n
Whitefish	$\log_e$ weight = -14.231 + 3.543 ($\log_e$ length)	0.993	44
Cisco	$\log_e$ weight = -13.155 + 3.365 ($\log_e$ length)	0.994	427
Walleye	$\log_e$ weight = -11.850 + 3.071 ($\log_e$ length)	0.988	306
Sauger	$\log_e$ weight = -10.797 + 2.854 ($\log_e$ length)	0.982	278
Northern pike	$\log_e$ weight = -11.491 + 2.936 ($\log_e$ length)	0.982	246
White sucker	$\log_e$ weight = -10.720 + 2.951 ($\log_e$ length)	0.941	648
Longnose sucker	$\log_e$ weight = - 8.044 + 2.481 ($\log_e$ length)	0.977	6
Shorthead redhorse sucker	$\log_e$ weight = -11.756 + 3.12 ($\log_e$ length)	0.994	39
Mooneye	$\log_e$ weight = -12.180 + 3.174 ($\log_e$ length)	0.987	416
Goldeye	$\log_e$ weight = -13.222 + 3.328 ($\log_e$ length)	0.994	4
Yellow perch	$\log_e$ weight = -11.014 + 2.971 ($\log_e$ length)	0.972	181
Burbot	$\log_e$ weight = - 8.594 + 2.501 ($\log_e$ length)	0.975	22
Freshwater drum	$\log_e$ weight = -16.186 + 3.847 ($\log_e$ length)	0.920	8

Table 42. Length - weight regressions for fish caught from West Cross Lake, 1987.

Species	Length-weight equation	r	n
Whitefish	$\log_e$ weight = -13.162 + 3.368 ($\log_e$ length)	0.998	40
Cisco	$\log_e$ weight = -12.509 + 3.277 ($\log_e$ length)	0.995	369
Walleye	$\log_e$ weight = -12.362 + 3.169 ($\log_e$ length)	0.985	321
Sauger	$\log_e$ weight = -12.894 + 3.230 ($\log_e$ length)	0.999	9
Northern pike	$\log_e$ weight = -11.827 + 2.992 ($\log_e$ length)	0.985	275
White sucker	$\log_e$ weight = -10.633 + 2.936 ($\log_e$ length)	0.968	106
Shorthead redhorse sucker	$\log_e$ weight = -10.470 + 2.900 ($\log_e$ length)	0.913	26
Mooneye	$\log_e$ weight = -12.575 + 3.241 ($\log_e$ length)	0.976	6
Yellow perch	$\log_e$ weight = -10.547 + 2.902 ($\log_e$ length)	0.980	48

Table 43. Length - weight regressions for fish caught from East Cross Lake, 1987.

Species	Length-weight equation	r	n
Whitefish	$\log_e$ weight = -12.348 + 3.233 ($\log_e$ length)	0.994	96
Cisco	$\log_e$ weight = -13.031 + 3.377 ($\log_e$ length)	0.994	361
Walleye	$\log_e$ weight = -12.180 + 3.149 ($\log_e$ length)	0.992	374
Northern pike	$\log_e$ weight = -11.448 + 2.939 ($\log_e$ length)	0.983	410
White sucker	$\log_e$ weight = - 9.665 + 2.778 ($\log_e$ length)	0.978	86
Shorthead redhorse sucker	$\log_e$ weight = - 9.947 + 2.828 ($\log_e$ length)	0.936	29
Yellow perch	$\log_e$ weight = -12.492 + 3.274 ($\log_e$ length)	0.991	20

Table 44. Mortality and survival estimates for whitefish, cisco, walleye, sauger and northern pike from Sipiwesk and Cross lakes, 1987.

Species	Lake	Instantaneous mortality (Z)	Annual mortality (A)	Annual survival (S)	r	Age classes used
Whitefish	Sipiwesk	0.136	0.127	0.873	0.721	9 - 16
	W. Cross	0.103	0.098	0.902	0.916	5 - 18 1.
	E. Cross	0.149	0.138	0.862	0.993	5 - 19 2.
Cisco	Sipiwesk	0.356	0.299	0.701	0.891	4 - 13 3.
	W. Cross	0.374	0.312	0.688	0.955	2 - 10 4.
	E. Cross	0.478	0.380	0.620	0.898	2 - 8 5.
Walleye	Sipiwesk	0.220	0.197	0.803	0.929	7 - 26 6.
	W. Cross	0.278	0.243	0.757	0.903	11 - 23 7.
	E. Cross	0.276	0.241	0.759	0.931	7 - 21 8.
Sauger	Sipiwesk	0.416	0.340	0.660	0.932	7 - 16 9.
	W. Cross	insufficient data				
Northern pike	Sipiwesk	0.613	0.458	0.542	0.938	7 - 13
	W. Cross	0.450	0.362	0.638	0.968	5 - 14
	E. Cross	0.812	0.556	0.444	0.978	6 - 12

1. Ages 5, 6, and 7 combined.
2. Ages 6 and 7 combined.
3. Ages 4 and 5 combined.
4. Ages combined: 2, 3; 7, 8.
5. Ages 2 and 3 combined.
6. Ages combined: 7, 8; 9-11; 12, 13; 15, 16; 18,19; 20, 21; 23, 24, 26.
7. Ages 15 and 16 combined.
8. Ages combined: 7,8; 9,10,11; 15, 16.
9. Ages 7, 8 and 9 combined.

Table 45. Maturity rate equations and age at maturity for whitefish, cisco, walleye, sauger and northern pike from Sipiwesk and Cross lakes, 1987.

Species	Lake	Sex	Regression	r	Age at 50% mature (yrs)	Age classes used
Whitefish	Sipiwesk	all	insufficient data			
	W. Cross	all	insufficient data			
	E. Cross	all	insufficient data			
Cisco	Sipiwesk	males	4.945 + (-1.183) x	0.922	4.2	2 - 7
		females	3.636 + (-0.875) x	0.784	4.2	2 - 9
		both	4.235 + (-0.993) x	0.833	4.3	2 - 9
	W. Cross	males	5.602 + (-2.238) x	0.999	2.5	1 - 3
		females	insufficient data			
		both	5.699 + (-2.400) x	0.951	2.4	1 - 3
	E. Cross	all	insufficient data			
Walleye	Sipiwesk	males	3.474 + (-0.438) x	0.935	7.9	3 - 14
		females	4.820 + (-0.559) x	0.901	8.6	4 - 13
		both	2.746 + (-0.316) x	0.712	8.7	3 - 17
	W. Cross	males	insufficient data			
		females	7.249 + (-1.204) x	0.886	6.0	4 - 8
		both	6.015 + (-0.992) x	0.876	6.1	4 - 9
	E. Cross	males	5.451 + (-0.997) x	0.822	5.5	4 - 7
		females	3.410 + (-0.773) x	0.869	4.4	4 - 8
		both	5.220 + (-1.028) x	0.974	5.1	4 - 8
Sauger	Sipiwesk	males	4.825 + (-0.744) x	0.706	6.5	3 - 11
		females	4.263 + (-0.510) x	0.879	8.4	4 - 12
		both	4.512 + (-0.564) x	0.959	8.0	3 - 12
	W. Cross	all	insufficient data			
Northern pike	Sipiwesk	males	2.264 + (-0.789) x	0.984	2.9	1 - 6
		females	2.173 + (-0.358) x	0.821	6.1	2 - 9
		both	1.877 + (-0.379) x	0.884	5.0	1 - 9
	W. Cross	males	0.772 + (-0.421) x	0.930	1.8	2 - 6
			1.191 + (-0.380) x	0.820	3.1	2 - 8
			0.746 + (-0.332) x	0.908	2.2	2 - 8
	E. Cross	males	1.414 + (-0.815) x	0.612	1.7	2 - 7
		females	4.123 + (-0.487) x	0.959	8.5	4 - 9
		both	0.572 + (-0.071) x	0.462	8.0	2 - 9

Table 46. Walford equation data for whitefish, cisco, walleye and northern pike from Sipiwesk and Cross lakes, 1987.

Species	Lake	Walford equations	L_∞	Age classes used	r
Whitefish	Sipiwesk	109.886 + 0.790 (x)	523	4-13	0.936
	W. Cross	insufficient data			
	E. Cross	155.755 + 0.733 (x)	584	1-9	0.940
Cisco	Sipiwesk	90.713 + 0.752 (x)	365	2-10	0.971
	W. Cross	133.176 + 0.667 (x)	399	1-5	0.860
	E. Cross	109.971 + 0.757 (x)	451	1-7	0.961
Walleye	Sipiwesk	99.968 + 0.749 (x)	397	3-14	0.969
	W. Cross	142.384 + 0.683 (x)	449	3-10	0.863
	E. Cross	103.035 + 0.785 (x)	479	1-14	0.958
Sauger	Sipiwesk	58.900 + 0.847 (x)	385	3-12	0.975
Northern Pike	Sipiwesk	101.993 + 0.892 (x)	941	1-8	0.982
	W. Cross	114.692 + 0.897 (x)	1109	1-9	0.984
	E. Cross	97.219 + 0.930 (x)	1393	0-9	0.997

Table 47. Brody relationship for whitefish, cisco, walleye and northern pike from Sipiwesk and Cross lakes, 1987.

Species	Lake	$\log_e (L_\infty - L_t) = a - b.t$	Age range (years)	r
Whitefish	Sipiwesk	$y = 6.057 - 0.196\ (x)$	4-13	0.923
	W. Cross	insufficient data		
	E. Cross	$y = 6.039 - 0.214\ (x)$	1-9	0.971
Cisco	Sipiwesk	$y = 5.856 - 0.277\ (x)$	2-10	0.979
	W. Cross	$y = 5.857 - 0.372\ (x)$	1-5	0.881
	E. Cross	$y = 5.825 - 0.223\ (x)$	1-7	0.967
Walleye	Sipiwesk	$y = 6.408 - 0.342\ (x)$	3-14	0.955
	W. Cross	$y = 5.896 - 0.281\ (x)$	3-10	0.830
	E. Cross	$y = 5.829 - 0.228\ (x)$	1-14	0.951
Sauger	Sipiwesk	$y = 5.631 - 0.164\ (x)$	3-12	0.988
Northern Pike	Sipiwesk	$y = 6.597 - 0.100\ (x)$	1-8	0.986
	W. Cross	$y = 6.815 - 0.094\ (x)$	1-9	0.996
	E. Cross	$y = 7.072 - 0.070\ (x)$	0-9	0.998

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Kirton, J.A.W. 1985. Fish population data from Rat, Karsakuwigamak, and West and Central Mynarski lakes, 1984. Man. Dept. Nat. Res. Fish. Br. MS Report No. 86-03. 48pp.

Patalas, J.W. 1984. Fish population data from Notigi, Wapisu, Threepoint and Footprint lakes, 1983. Man. Dept. Nat. Res. Fish. Br. MS Report No. 84-25. 70pp.

Appendix 1. List of Manitoba Department of Natural Resources Fisheries Branch reports written to date on data collected from the Churchill-Nelson River Diversion under the Northern Flood Agreement Claim numbers 12 and 18. Documents are listed in chronological order of publication.

Year	Title
1984	Patalas, J.W. 1984. Fish population data from Sipiwesk, Split and Stephens lakes, 1983. Man. Dept. Nat. Res. Fish. Br. MS Report No. 84-24, 66pp.
	_____ 1984. Fish population data from Notigi, Wapisu, Threepoint and Footprint lakes, 1983. Man. Dept. Nat. Res. Fish. Br. MS Report No. 84-25, 70pp.
1986	Derksen, A.J. 1986. Ecological Monitoring - Fisheries 1985 Progress Report. Man. Dept. Nat. Res. Fish. Br. April 9, 1986. 43.pp.
	Kirton, J.A.W. 1986. Fish population data from Rat, Karsakuwigamak, and West West and Central Mynarski lakes, 1984. Man. Dept. Nat. Res. Fish. Br. MS Report No. 86-03, 48pp.
	_____ 1986. Fish population data from Split and Stephens lakes, 1984. Man. Dept. Nat. Res. Fish. Br. MS Report No. 86-04, 61pp.
	Green, D.J. 1986. Summary of Fish mercury data collected from lakes on the Rat-Burntwood and Nelson River systems, 1983-1985. Man. Dept. Nat. Res. MS Report No. 86-06, 359 pp.
	Mohr, L.C. and J.A.W. Kirton. 1986. Fish population data from Sipiwesk and Cross lakes, 1985. Man. Dept. Nat. Res. Fish. Br. MS Report No. 86-28, 83pp.
1987	Hagenson, I. 1987. Fish population data from Rat and Split lakes, 1985. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-04, 59pp.
	Kirton, J.A.W. 1987. Fish population data from Macheewin, Osik, Footprint and Threepoint lakes, 1984. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-06, 78pp.
	Green, D.J. 1987. Summary of fish population data from Rat and Threepoint lakes, 1986. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-07, 47pp.

Appendix 1, continued.

Year	Title
1987	Kirton, J.A.W. and L.C. Mohr. 1987. Fish population data from Wuskwatim and Apussigamasi lakes, 1984. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-08, 44pp.
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